DOCUMENT RESUME

ED 304 312 SE 050 369

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TITLE Increasing Utilization of an Educational Forest To Enhance Environmental Science Curriculum for Elementary Students.
PUB DATE 87
NOTE 136p.; Ed.D. Practicum, Nova University.
PUB TYPE Reports - Descriptive (141) -- Reports - Research/Technical (143) -- Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS *Conservation (Environment); Conservation Education; Ecology; Elementary Education; *Elementary School Science; *Environmental Education; Experiential Learning; *Forestry; *Inservice Teacher Education; Land Use; Natural Resources; *Outdoor Education
IDENTIFIERS North Carolina

ABSTRACT

This practicum was designed to increase and expand the use of an environmental education center available in the Bladen Lakes State Forest in Elizabethtown, North Carolina. The immediate goal was to provide teachers with a new awareness of the offerings and availability of the site to increase the likelihood of participation with students. The primary goal was to enhance awareness and appreciation for the forest, its beauty, preservation, and management. The causes of lack of use were determined by surveying local teachers. The most prominent obstacles identified by the survey were removed by coordination of resources, county-wide planning, and inservice training. Teachers and students were provided with opportunities to learn in the forest. Teachers who participated in inservice training reported feeling more competent teaching the concepts, and students showed greater interest and gains in environmental knowledge after visiting the forest. (Author/CW)

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Increasing Utilization of an Educational Forest To Enhance Environmental Science Curriculum For Elementary Students

by

Ann Pharr Elks

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NOVA UNIVERSITY

Increasing Utilization of an Educational Forest To Enhance Environmental Science Curriculum For Elementary Students

by

Ann Pharr Elks

Cluster 21

A Practicum I Report Presented to the Ed. D. Program
in Early and Middle Childhood
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Nova University

1987

PRACTICUM APPROVAL SHEET

This practicum took place as described.

Verifier: _____ (Signature)

Superintendent of Bladen County Schools
Title

Bladen County Schools
P.O. Box 37, Elizabethtown, NC 28337

June 29, 1987
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This practicum report was submitted by Ann Pharr Elks under the direction of the adviser listed below. It was submitted to the Ed. D. Program in Early and Middle Childhood and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

July 20, 1987
Date of Final Approval of Report

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ACKNOWLEDGEMENT

The writer of this proposal is deeply indebted to the personnel of the Bladen Lakes State Forest. Their cooperation and encouragement in development of the plan, and their hard work in implementing for the teachers and students consequently led to improved environmental education in the Bladen County Schools.

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENT		iii
TABLE OF CONTENTS		iv
APPENDICES		v
LIST OF TABLES		vi
ABSTRACT		vii
Chapter		
I	INTRODUCTION	1
	Description of Community	1
	Writer's Work Setting and Role	4
II	STUDY OF THE PROBLEM	6
	Description of the Problem Situation	6
	Problem Documentation	10
	Causative Analysis	11
	Literature Review	12
III	ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS	16
	Statement of General Goals	16
	Behavioral Expectations	17
	Evaluation Instruments	18
IV	SOLUTION STRATEGIES	20
	Discussion and Evaluation of Solutions	20
	Description of Selected Solutions	22
	Report of Action Taken	24
V	RESULTS, CONCLUSIONS AND RECOMMENDATIONS	26
	Results	26
	Conclusions	31
	Discussion	33
	Recommendations	33
	Dissemination	34
REFERENCES		36

Appendices Page

A GLOSSARY OF TERMS: NAVAL STORES 41
B INCOME STATISTICS.....45
C JOB DESCRIPTION 48
D FORESTRY CURRICULUM MATERIALS.....54
E MAPS..... 73
F ATTENDANCE RECORDS 76
G ADMINISTRATIVE SUPPORT: FOREST..... 78
H SCHOOL ADMINISTRATIVE SUPPORT..... 82
I TEACHER SURVEYS 85
J WORKSHOP PARTICIPANT SURVEY 87
K TESTS: PRETESTS AND POSTTESTS..... 91
L PARENT INFORMATION LETTER..... 94
M FORESTRY PERSONNEL EVALUATION..... 97
N NEWSPAPER COVERAGE: WORKSHOP 100
O SCHOOL BOARD RESOLUTION.....105
P NEWSPAPER COVERAGE OF FIELD TRIPS.....107
Q CALENDAR PLAN 110

LIST OF TABLES

Table		Page
1	Pretest and Posttest Results	29
2	Evaluation Summary Report	31

ABSTRACT

Utilization of a Community Resource to Enhance Environmental Education, Elks, Ann P., 1987: Practicum Report, Nova University, Ed. D. Program in Early and Middle Childhood.
Descriptors: Environmental Education/Outdoor Education/Ecology/ Forestry/Conservation/Scientific Inquiry

This practicum was designed to increase and expand the use of an environmental education center available in a nearby state forest. The immediate goal was to provide teachers with new awareness of the offerings and availablility of the site to increase the likelihood of participation with students. The primary goal was to enhance awareness and appreciation for the forest, its beauty, preservation, and management.

The writer determined the causes of lack of use by surveying local teachers. The most prominent obstacles identified by the survey were removed by coordination of resources, county-wide planning, and inservice training. Teachers and students were provided with opportunities to learn in the forest.

The results of the practicum were positive. Teachers who participated in inservice on site felt more competent teaching the concepts and students showed greater interest and gains in environmental knowledge after visiting the forest.

CHAPTER I

INTRODUCTION

Description of Community

The setting of the problem to be discussed in this report is a small rural community in southeastern North Carolina. In order to understand the problem, it is necessary to understand the particular characteristics of schools in the area and the evolution of the community.

Educational systems in this part of North Carolina are different from those in other parts of the state because they are predominately rural. Students, teachers, and parents from this pastoral setting often lack experiences in adapting to and accepting nontraditional situations. These rural areas are typically lacking in some resources found in the urban centers of North Carolina and their environs. The particular area of this discussion is 100% rural with no single area of dense population. Rather than a multiplicity of cultures, there exists nearly a common culture differentiated more by race than any other distinguishing feature. Racial composition is 60% white, 39% black, and 1% native American. The similarity of background has an educational advantage in that the students have similar experiences on which early childhood teachers can begin to build formal learning. Another probable advantage is lack of exposure to some negative aspects of society that are rampant in more culturally diverse and mobile communities.

Historically, the area is economically self-sufficient depending heavily on food crops and naval stores. During the 1800's naval stores industries flourished. From the vast pine forest of the coastal plain, naval stores and lumber became the two major industries. North Carolina led the world in naval stores production from the early 1700's to the late 1800's with the center of production activity in the southeastern section of the state near the coast.

Naval stores are the group of products harvested from pine trees. Tar, pitch, rosin, and turpentine were produced from the forest of loblolly and long-leaf pine trees. The tree was scored and sap drained and collected in a container at the base of the tree. The collected sap was cooked in a kiln and processed in a way similar to distillation and used as the base for products needed by the English Navy and Merchant Marines. Tar and pitch were used to seal the boards of ships and make them waterproof and seaworthy. Naval stores derivatives were also used to coat the ropes and seal them against deterioration from weather. Reference to a glossary of terms and facts related to naval stores industries (see Appendix A) further defines and clarifies the importance of these "stores" to the economy directly and through subsidiary industries such as barrel making, tool making, and shipping trade.

Geography, as well as economics, has played a very significant role in the evolution of the community which is the focus of this discussion. The strategic location of a river cutting through the center of the school district was likely the cause of the development of an early trade center. The river provided shipping access. There

was an abundance of pine forests; and pine forest products could be shipped via the river. Small ships could navigate the river to be loaded with the naval stores products and lumber. They could then return to and traverse the Atlantic to the shipbuilding empires of Europe.

Changing times led to a changing economy in the area. Naval stores industry declined and cotton became the leading crop. Cotton was king economically during the years prior to the Civil War when slave labor was abundant. Then in the 19th century, cotton gave way to tobacco as the leading crop, which recently gave way to peanuts. Although the area's major income producer is no longer agriculture, an agricultural environment and atmosphere still exist.

At the present time, the area within this school district has a low per capita income compared with the surrounding areas of the state and state average. The labor force is chiefly low skilled industry. Until the 1950's, agriculture was the primary means of earning a living. Per capita income based on the 1980 census was $4,700 compared to the state average of $6,600 (see Appendix B) and the labor force of 12,000 was catergorized as 80% low skilled.

Although the economic base has changed almost continuously, the population of the area has been relatively stable. Fluctuations can be traced directly to economic conditions. An increase was slow but steady until the 1950 decade. In early 1950, a decline began that has continued until the present. The decline that began in the 1950's paralleled the status of increased unemployment, low economic production, and resulted in out-migration of the work force.

Family structures have also remained stable. Family patterns characteristic of the area consist of extended families with close ties through several generations. Most friends of parents and children are known to each other. These close-knit families with much overlapping of relationships are typical.

The majority of the student population reflects the environment described above by having a limited experiential background when compared to a more diverse community. The parents of the students are desirous of the best education possible for their children; however, as the statistics reported above indicate, both physical and financial resources are limited. Thus, the children of the area are in some ways deprived of some experiences available to students in more affluent areas. With clientele as described and limited resources, it is particularly important that every local community resource available be utilized to its full potential. Frugality and resourcefulness are essential in the use of local assets to effectively meet the educational objectives in such a community. The educational system described in this report needs to take advantage of any compensatory enrichment opportunities available as well as the independent educational merit of the community.

Writer's Work Setting and Role

The focus of this practicum is within the rural school district which has a population of 6,100 students. The district is organized according to the political boundaries with county line borders serving basically as the school district lines. The administrative hierarchy consists of one superintendent, one associate superintendent

one assistant superintendent, and a central office administrative staff of directors, program administrators, and coordinators. Each school within the district has one full-time principal and at least one part-time assistant designated according to the number of students in the particular school.

The perspective of the writer is from the role of Staff Development Coordinator and Supervisor of Elementary Education. Job goals and performance responsibility inherent in this position include coordinating in-service education programs which are designed to meet the needs identified by the educational community. Another major responsibility within the sphere of staff development and supervision is to align teaching practices with teaching and learning goals. Efforts of the faculties are coordinated with facets of the educational program by designing, conducting, and implementing the content of appropriate training in preparation for curricular needs.

The job goal of Elementary Supervisor is to coordinate the instructional program for the elementary schools (grades 4-8) systemwide and to ensure that each elementary school student is provided with the richest educational experience the school system can provide. The evaluation component of that responsibility requires identifying opportunities and making recommendations for needed changes and improvements. It is appropriate that the writer identify discrepancies that exist between the educational experiences that are attainable and what actually happens in the schools. Any awareness or action that can be directed toward improving a situation is inherent in the position based on performance responsibilities (see Appendix C).

CHAPTER II

STUDY OF THE PROBLEM

Description of the Problem Situation

The problem addressed in this practicum is that an available environmental education center established by the State Forest Service was not being properly utilized by the local system for learning ecology concepts and for exploring environmental issues. Although the problem setting was in a somewhat depressed economic area, this valuable community resource was available and could be used to enrich environmental education and to help the local schools realize the goals set for science education. The problem was stated and addressed as "Increasing Utilization of an Educational Forest to Enhance Environmental Science Curriculum for Elementary Students."

Reasons for the problem were to be explored and solutions found to increase the use and consequent learning as a result of the experience. The use of the facility would provide an optimum environment for enriching learning in the ecology component of the science curriculum.

The responsibility and challenge inherent in the position of the writer as Elementary Education Supervisor included the recognition of need for exposure to the kind of learning experiences available at this center. An analysis of the problem indicated that utilization of this facility and the discovery lesson plans prepared jointly by educators and forestry experts were expected to help students to further develop scientific inquiry skills about the environment. Use of the center would facilitate achievement of the systemwide environmental science goals. Both teachers and students would increase

their awareness of the forest and gain a greater sensitivity and appreciation for the importance of its preservation.

The central point of examination of the science curriculum was to be components reflecting environmental and ecology concepts.

At this time, most science instruction was conducted within self contained classrooms with limited facilities, equipment, and material. State adopted textbooks were used along with supplementary and media resources. Resource people were used in some settings. There was a supplement to the science staff development through Title II of the Economic Education Security Act, and a local supplement to the science curriculum budgeted for ancillary materials.

According to the curriculum guide, goals of science instruction should be child centered with objectivity and open minded inquiry. The forest environment educational site provided a setting that would enable this goal to be achieved. The state demonstration forest has historic as well as economic significance and was designed to be an ecology laboratory. Heritage education is exhibited within the forest via the natural environment and evolution of the present landforms. Heritage education, the study and interpretation of the history and traditions of a local community in its state and national context, is demonstrated by the evolution of the present setting.

At one time, the area, which is now forest, was swamp land. It was later ditched by slave labor and canals drained off the excess water so the land could be cultivated as farm land. Within the last 50 years, the area has reverted to forest land. Establishment of the land as a state forest was a part of the New Deal Program that provided

jobs under the Civilian Conservation Corps for people struck down by the great depression. The CCC program conserved forests and other natural resources by improving and caring for them. North Carolina had more than 60 CCC Camps. These federally employed workers reforested the area, and it was established as a refuge for wildlife as well as a state forest.

The 32,000 acres of forest land have been managed by the Division of Forest Resources since 1939. The self supporting forest has derived income from logs of different types and from pulpwood. Lesser forest products such as chip and saw operations, charcoal, and treated fence posts also provide income. Within the forest is a series of educational demonstration trails where all phases of forest products management and operational techniques can be observed in process.

These trails are designed to give an opportunity to better observe and understand the forest and its many functions. In addition to drive-through trails, walking trails have been established at various points. The four major walking trails show detailed explanatory exhibits of naval stores, a nature path, forest management products, and woodland products. In addition to providing for observation of forest functions numerous wild animals and their homes can be seen in natural habitat.

The purpose of development of this interpretative and demonstration trail was to provide a living environmental education area for study. The forest educational area was designed to facilitate a better understanding of the value of the forest in our society. Forestry personnel is available to assist groups. Ranger conducted programs

are available to groups. Outdoor study sites and a natural ampitheater are available to teachers who use the forest as an outdoor educational site. Activities within this packet are complete lesson plans designed to allow discovery learning within the forest. Compatibility of environmental science objectives with the curriculum materials developed by the forestry personnel can be verified by examination of materials within Appendix D which includes examples of the types of lesson activities available. Experiments that can be conducted at specific study sites, observation and recording tasks, and study assignments that require discovery methods are included. These activities provide experiences that are compatible with curriculum goals.

In addition to numerous scientific experiences, one area of the environmental education center is devoted to demonstration of naval stores. Thus, the center embraces social studies as well as scientific learning. Of the numerous science related learning experiences, one is leaf and tree identification with "talking trees" that tell their own story when activated by the touch of a button. Skills of computation such as measurement of board feet, estimating volume of wood in a standing tree, amount of paper that can be made from one tree and many more are incorporated into the exhibitions. Spatial concepts are experienced by identification of distance and the visual concept of an acre by banding boundary trees. A display of the way lumber is treated, used, life expectancy of posts of different types are demonstrated by models and visuals along the demonstration trails. One area includes forest fire control techniques complete with trails

and equipment used in forest fire management. A map of the forest (see Appendix E) provides direction to each site.

Although the state forest described in the setting is one of the primary educational assets in the community many local educators did not utilize the environmental area with their students. In spite of the easy access and proximity, a low percentage of students benefited from the enriched learning opportunities available.

Problem Documentation

Limited use of the forestry learning stations was verified by a report of attendance from the Assistant Forest Supervisor. Informal attendance records (see Appendix F) indicate that of the 6,100 students in the local school system, only 564 visited the forest during the 1985-86 school year. This represents less than 10% of the elementary students utilizing the facility and the remaining 90% not being exposed to the resource.

The educational center is within a few minutes of every school within the district being discussed. There are thirteen schools, nine primary and elementary and four high schools. During the two years that the demonstration trails have been operational the percentage of students that have visited and utilized the facility was inappropriate.

Forestry administrators were supportive of all efforts to increase the use of the educational sites. Correspondence from the Assistant Forest Supervisor (see Appendix G) documents this support. Existence of further support from school administrators (see Appendix H) is

documented. The writer was encouraged by this supportive approval to explore ways to augment utilization of the demonstration trails and educational sites.

Causative Analysis

An investigation into the causes of this problem yielded a variety of responses. A copy of the survey instrument used to collect this information (see Appendix I) and a tabulation of the results showed that the most prominent response was difficulty with the logistics of field trips. Transportation must be handled by a special request through the campus principal and central office administration. Elementary schools in this system did not have busses or vans at their disposal. The cost of field trips was the responsibility of the students at the rate of fifty cents per mile. Although this amount was minimal, some students in a low per capita income setting as described were not able to pay their share of the trip cost. This presented a dilemma for the teacher because these students must have differentiated instruction, compensatory assignments, and individualized attention for follow up and culminating learning that results as an outgrowth of the field trip. The additional clerical duties that accompany such an endeavor, like the collection of money, took part of the teachers instructional time. Another responsibility mentioned in response to questions about field trips was liability. Although school policies dictate that teachers collect signed permission slips for field trips, there is a greater liability risk felt by teachers when students are away from familiar surroundings. The teacher surveys mentioned vulnerability to litigation and students at higher

risk for accidents and getting lost in unfamiliar outdoor settings than in the regular classroom or conventional environment.

Another response that occurred frequently in the survey questionnaire was difficulty in scheduling within the departmentalized day in the typical middle school. With subject periods that last approximately one hour, a field trip involved interruption of another teacher's classes. If only one class was involved, students missed assignments or fell behind in meeting deadlines.

Some teachers surveyed felt that the context of the educational sites was inappropriate for their grade level. Some early childhood teachers felt that their students were not ready for the learning experiences within the sites due to their maturational level. Others thought the center was geared more for older students and the scientific processes they learn. Conversely, some middle and junior high teachers felt that the emphasis in the forest educational sites was focused on learning experiences for younger children. They cited textbook contents as the core curriculum for their grade level scientific skills and discounted the appropriateness of a field trip to the forest.

A myriad of difficulties was cited by individuals as specific reasons why they elected not to take field trips to the forests. Teacher and student allergies, fear of snakes and insects, hot and cold weather extremes, and schedules too full to press in more activity were some of the other reasons.

Another questionnaire (see Appendix J) was distributed to a group of teachers who participated in a workshop in the forest. This group

of teachers received instruction from forestry educational specialists on how to maximize the forest for the benefit of their students. Their participant evaluations were ranked very high. Most checked the highest ranked column "strongly agree" that the experience was meaningful and beneficial. Answers to the questionnaire about reasons they attribute to the low percentages of use were comparable to the broader and more general survey. Some responses were related to teaching areas skills. Participants felt that teachers did not know enough about the things they could teach in the environmental site unless that had concentrations or special interest in science.

The extra duties and concerns of field trip planning, collecting money, gathering information, and making arrangements for students not participating were cited again by this group. Repulsion to the woods because of ticks, mosquitoes, and snakes was also suggested. The amount of walking required to accompany a group on the forestry field trip was listed as a drawback by some.

The forestry workshop participants pointed out that students might be harder to discipline on such outings. They felt the responsibility to discipline was still with the teacher even though forestry educational personnel might be conducting the actual instruction. The hours of preparation time, location of chaperones to assist on the trip, scheduling of make-up work, and notification of other teachers of the participants are some of the other problems cited on the questionnaire as drawbacks to field trips.

Literature Review

Educational research has consistently reported that when students enjoy, discover, seek and find their own answers, learning is more meaningful. Knapp (1975) has shown when students experience and delight in discovery, when they become concerned and want to improve their surroundings, they are engaged in environmental education. According to Knapp, the concern about the need for protection of the environment is the essential factor.

Biggs and Tap (1986) expound on this idea and they further recommend short discovery sessions with follow up investigations. The Biggs and Tap work suggests that students must first experience surroundings by observation before environmental concepts have importance and meaning. Simple outdoor experiences are recommended to convey theory learned in the classroom. The things students learn about become significant only when they are related to some experience from which meaning can be derived.

Adams, Charles, Greene, and Swan (1985) identify a problem in science teaching today. These researchers depict a discrepancy in the science being taught and the science needed to prepare students for tomorrow's world. Science is needed at the community level and the natural environment, community resources, and the students themselves need to be the foci of study. These researchers suggested that the science teacher, as well as the student, needs to experience learning as a process of inquiry rather than learn from a textbook. They recommend that science learning be active rather than passive.

The same discrepancy existed within the setting of this paper. Science was being taught from textbooks in classrooms entirely rather than outdoors. Environmental education could be taught within the forest where appropriate attitudes toward conservation and preservation could develop aesthetically.

Disinger (1986) reported on instruction in awareness of environmental issues in a report of recent research. A group of studies was compiled and the following conclusions about environmental knowledge was reported.

1. Traditional classroom instruction can improve students' environmental knowledge.

2. Interdisciplinary approaches for examining problems show better results than traditional approaches.

3. A combination of classroom instruction and field trips is effective in increasing knowledge of environmental issues.

4. Outdoor environmental learning activities increase knowledge of environmental issues.

5. Reading skills stem from language and logic development which comes after concepts are formed from encounters with objects and events in the real world.

In addition to enhancing language and reading, environmental science taught from experiences in the natural world can be used as an invitation to count, measure, write, and debate. Hounshell and Coble (1985) felt that science should be the most basic component of a child's curriculum K-12: "Our environment is basic to our life and survival" (p.74). They further stated that a democratic society

depends upon a citizenry that is intelligent and has the ability to consider many alternative solutions to a problem. Concern for the sound management of natural resources has to be addressed by a large number of scientifically literate citizens.

Coble, Rice, and Weiss (1979) suggested that without the provision and use of adequate facilities an exciting experimentally based environmental science curriculum could become a textbook oriented program whereby students read the textbook, answer end-of-chapter questions, and memorize vocabulary terms. This type of instructional approach, although useful at times, is not the exciting and experimentally based program that should be offered to elementary students.

According to this review of the literature available, the ideal situation to exist in the school system being described would be for students to utilize the educational center maximally and thereby develop attitudes needed for conservation, preservation, and wise use of natural resources. Scientific process skills would be developed through observing, classifying, experimenting, and interpreting natural phenomenon.

Emphasis was to be placed on the curiosity and exploratory nature of the elementary aged child. Hands-on experiences would provide opportunities for the use and development of science skills and lead naturally and gradually to the understanding of basic science and environmental concepts. Societal issues which encompass energy and environmental concerns would permeate the science curriculum. The materials available and the facility described would support the

desired learning outcomes as stated in the school's science education philosophy.

Although the volume of available literature was small, the statement was consistent and significant. Students benefit from learning experiences with direct involvement and active participation such as those available in the educational forest.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Statement of General Goals

The general goals of this practicum were:

1. To enhance environmental education in the local elementary school by improving the quality, content, and amount of instructional time spent on topics related to environmental issues and ecology.

2. To motivate positive attitudes toward learning in outdoor education methods.

3. To provide hands on experiences in the scientific skills of observing, measuring, and classifying and to provide active participation in use of the inquiry method: formulating hypotheses, designing experiments, interpreting data, and drawing conclusions.

4. To foster democratic interaction opportunities in a group learning situation thus improving human relations and making school experiences meaningful by applying skills to real-life situations beyond the classroom.

5. To expose students to the natural world and cultivate awareness and concern for its protection.

6. To provide a repertory for leisure time activities conducive to aesthetic appreciation and physical fitness.

It has been documented by local curricular goals as well as research that the environmental science aims can best be met by providing experiences like those available at the forest. Expanding awareness of the offerings in the educational community was a goal

that could lead to more extensive use of the forest facility and consequently to enhancing environmental education.

Behavioral Expectations

Increased environmental awareness and knowledge of ecological principles were the result of implementation of the strategies suggested by this report as documented by the following behavioral expectations:

1. a. Each student will learn more as a result of spending more time on concepts related to ecology in a more appropriate setting.

1. b. Each teacher will spend more time teaching ecology related concepts.

2. a. Each student will demonstrate more interest in the forest.

2. b. Each teacher will demonstrate more competence and have fewer reservations about using the forestry educational facility.

3. Each student will show attainment of scientific processing skills of observing, measuring, and classifying and demonstrate acquisition of the steps of inquiry by formulating hypothesis, designing experiments, interpreting data and drawing conclusions.

4. Teachers and students will be expected to demonstrate improved relationships and apply learned skills in problem solving situations within the forest.

5. Each student will demonstrate respectful behavior in the forest indicative of appreciation of its beauty.

6. Each student will demonstrate use of the forest as a recreational facililty by increased interest and attendance.

Evaluation Instruments

The evaluation instruments and strategies employed in determining the success of the goals and behavioral expectations of this practicum included:

1. a. Pretests and posttests were administered by educators on various learning activities. The same test was used for the pretest and posttesting (see Appendix K).

1. b. A daily record was kept by teachers showing lesson plans implemented to complement the field trips and recorded incidents related to the environmental education units.

2. a. Teachers completed state standard staff development evaluation instruments based on forestry inservice workshops with rating scales: strongly disagree, disagree, undecided, agree, and strongly agree.

2. b. Evaluations were tallied and reported on form SD26, Summary of Evaluations.

3. Scientific process skills attainment was evaluated by observing methods of approach to problem situations in the forest and reported by observers.

4. Reporters observed increased communication between students and teachers and reported to the writer.

5. Evaluation of completed products was used to assess awareness and concern for protection of the environment.

6. Observation of increased use of environmental education site as reflected by forestry attendance records as well as student self-evaluation forms regarding awareness and appreciation was the

evaluation process used to determine accomplishments of awareness.

7. Teachers kept a log of activities and classroom experiences.

8. The writer kept an incidence log on the activities of the practicum.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Solutions

A search of available literature for possible solutions to the problem of providing appropriate environmental education experiences yielded several exemplary programs in outdoor education. Educational activities for outdoor learning were available in abundance.

One example was the Montgomery County, Maryland, Schools Outdoor Science Education Program (1985). Students in the Montgomery County system have a week long residential experience in the natural environment. This direct experience provides the foundation upon which a behavioral change can take place. Through exposure and pleasure, students gain understanding about their environment and the need to maintain and protect it.

The Montgomery County program has operated successfully for twenty years. Over 9,000 students have participated in the residential outdoor program. According to the Suprintendent of Schools, Wilmer S. Cody, (1985) much relevant learning occurs in the program. The program originated as a result of some teachers wanting students to have direct experiences with discovering the natural world. The extensive and exciting program has been developed on the motto, "Nothing is real until it is experienced."

The solution described by example of the Montgomery County Schools appeared to be ideal, however, it would require a commitment of resources and personnel not available to the writer in the community

where the practicum is being implemented. Although the forests were designed as educational sites, no overnight facilities are available. School personnel are not adequately trained in outdoor skills and safety practices to make such a solution plausible. The writer did not eliminate the idea that a smaller scale beginning might lead to an expanded program resembling the Montgomery County program sometime in the future.

Another example of the perfect place to learn firsthand about nature and the importance of protecting our environment is 35 acres of untamed land adjoining a school, Bellbrook High in Bellbroke, Ohio (1986). This outdoor classroom has a variety of animal life, including fox, deer, species of birds, and plenty of room for students to explore. Biology teacher, Jerry Kallas, is concerned that citizens are gradually destroying the earth's environment. He has developed the area and takes students on nature trips twice a week. Kallas sites a discrepancy in behavior in that people don't seem concerned about saving the environment for themselves but will fight to save habitats for birds and animals after they have become familiar with them.

The proximity of land areas near the various schools within the setting of this practicum made this solution impossible. However, the forest educational site was reasonably accessible by bus to all students within the school system. While the Bellbrook solution was not applicable in total, the same experiences could be provided at the forest site for elementary students. A wildlife area could be developed with feeding and habitat needed for wild creatures to survive.

Among the numberous programs discovered in the literature search was Stronch (1982) who suggested the advantages of using forests to teach succession. Stronch outlined procedures for gathering evidence of succession including numbers, ages, and sizes of trees. Plot studies were described and examples given for their use.

Kurner (1979) described the activities of a school district establishing an outdoor education center. He included budget information, community involvement, and resources needed. Although the report was interesting, it was not applicable because the site in this discussion was established and the programs were in place. Some of Kurner's suggestions for community involvement were incorporated into this practicum plan and were helpful in implementation phases including use of community volunteers as guides. Use of the facility for social gatherings and overt publicity of the offerings were extrapolated form Kurner's work.

Description of Selected Solution

The writer concluded that the most apparent solution to solving the problem was removal of the obstacles that prevented the site from being used. Thus, the discrepancy between what was actually happening and what should be happening in environmental education in the local school system would be eliminated. These obstacles were delineated by the surveys asking teachers why they did not use the forest as an outdoor teaching and learning site.

First, the problem of teachers feeling inadequate to handle the situations that might arise or lack of knowledge was dealt with

through in-service education. Teacher in-service was arranged with forestry educators in collaboration with the Regional Science Coordinator and Forest Interpretative Rangers. A staff development based on the various competencies needed by teachers in outdoor science education was offered to teachers with certificate renewal credits and a stipend for attendance.

Lack of awareness about the offerings was attacked by dissemination of information via presentations to various groups. Civic clubs, community groups, and neighboring school administrative units were apprised of what was available. More community awareness was accomplished by notifying local newspapers when the various activities were scheduled thus creating more public attention to the facility. Memoranda promulgated to each school appropriate curricular objectives published by the forestry educational service.

Another of the logistical problems was solved by funding the transportation expense at the county level. This alleviated the financial obstacles and inherent clerical responsibility for the teacher. Transportation was arranged by the central office administrative staff. Busses and drivers were made available on a scheduled basis for students to be shuttled to the educational centers in the forest. This arrangement eliminated the imposition of borrowing busses and scheduling responsibility. The funding from the administrative level of the local education agency prevented the individual schools from bearing the expense from their limited budgets.

The above solutions can be justified and defended as appropriate because they were specified by the teachers surveyed as being the

major obstacles to field trips to the educational facilities available in the forest.

Report of Action Taken

Specific steps taken by the writer to implement this practicum included the following:

1. Planning and organizing an in-service training for teachers in practices of conservation in general and specific learning facilities available to the teachers in the educational sites in the forest.

The staff development workshop series was arranged with forestry educators, Regional Science Coordinator, and science program consultants. The necessary competencies were taught, discussed, and practiced to equip the teachers with the skills and knowledge to competently teach environmental education in the classroom in preparation and background building for the actual forestry field trip experience.

2. Another action taken by the writer was publication within various groups to disseminate information about the offerings within the forest. Presentations and tours were made or arranged by the writer to Girl Scout groups, Boy Scout groups and to various teacher groups, neighboring science coordinators, in addition to the target group.

3. Meetings with forestry personnel began with collaboration on the plan, implementation, and objectives of the practicum. Preplanning logistics such as requests for instructional personnel, reservation

of facilities, and content selection were outlined.

4. A committee of teachers was identified to serve as advisors in planning the in-service and field trips. The writer solicited the help of this group to survey and administer teacher and student questionnaires.

5. Publications for public awareness were accomplished by notification of local newspapers, program presentations at area civic organizations, and dissemination of memoranda through interschool mail. More specific community support was sought through a letter to parents of participating students (see Appendix L) describing offerings and issuing an invitation to families to visit the facility on weekends. The long range results of more public awareness will be shown by increased interest evidenced by greater attendance over an extended period of time beyond the scope of this report.

6. A meeting was held with school administrators to present and secure approval of the components of the plan. The overall objective had been encouraged and approved, but each component was worked out jointly among departments. In-service was the responsibility of the writer as Staff Development Coordinator. Publishing, scheduling, and transportation had to be generated from the appropriate office and department. The entire plan had to be approved by forestry administrators and school administrators before implementation could begin.

CHAPTER V

RESULTS, CONCLUSIONS AND RECOMMENDATIONS

Results

The first major goal of this practicum was to enhance environmental education in the local elementary school by improving the quality, content, and amount of instructional time spent on topics related to environmental issues. A pretest and posttest was used to determine the degree of success and the results may be applicable to other goals as well. Evaluation devices and processes employed in determining the degree of success of this practicum showed the following results:

1. Posttests given students who participated in the forestry field trip showed gains of 10, 20, and 30 points on a ten item, 100 point test. Of the 26 classes involved, all teachers orally reported gains. Only fifteen teachers returned both pretest and posttest results in reportable form. Table 1 illustrates the results of these reports.

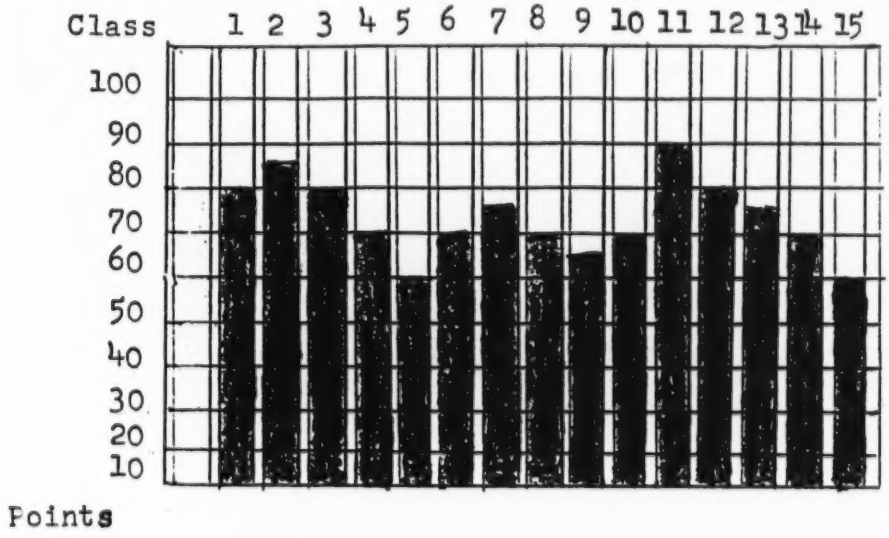
2. Teacher lesson plans and daily logs showed the amount of classroom time spent teaching science and ecology. During an informal evaluation session, teachers reported that they spent more time than in prior years. Records had not been kept in previous years. Teachers also commented that they had learned much from the activities as well as the students. The general response to the experience was positive.

According to the literature review, these concepts were taught in a more appropriate environment. Teachers concurred and explained

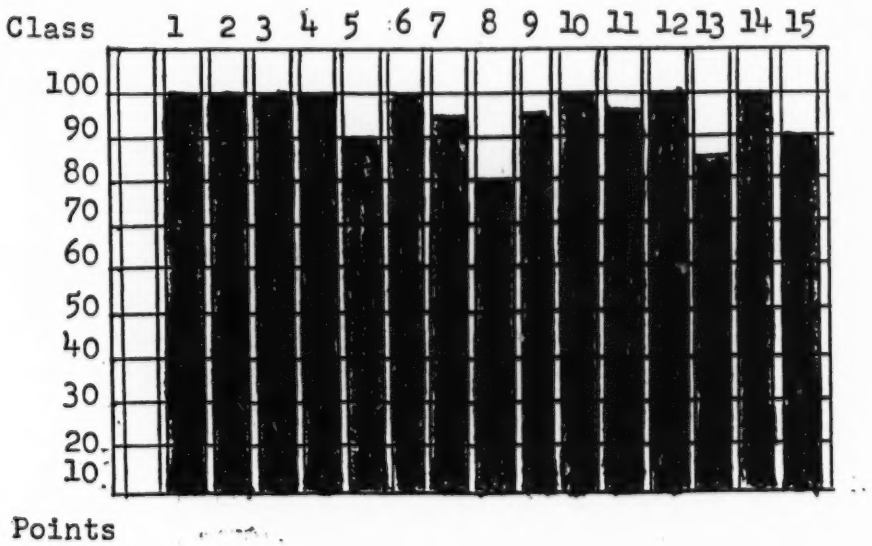
Table 1

Class Averages

Pretest Results



Posttest Results



that they had written more extensive lesson plans as a result of preparing the students for their field trips.

The second major goal of this practicum to motivate positive attitudes toward outdoor learning and environmental education goal was accomplished.

All teachers ranked the evaluation of the staff development activity at one of the two highest standards on a five criterion scale. The summarized evaluations of participants (see Appendix I) reflected ratings in the top categories signifying success in this goal.

The staff development evaluation summary report shown in Table 2 indicates the specific ratings of the teacher participants.

Both teachers and students demonstrated interest and competence with few reservations about the educational facility. Teachers attributed their confidence to the staff development in the forest. According to the follow up questionnaire, their fears and insecurities were alleviated by experiences in the forestry setting.

Goal three of the practicum addressed the need and advantage of providing active learning. Students were observed and reported as being actively involved in inquiry and problem solving within the forest setting.

Various problem solving scenarios were in place at strategic sites along the trails. Some were teacher or ranger directed. Others offered an opportunity for students to practice the scientific method of problem solving. The conclusion of improved abilities was supported by conversations with the participants, observations of their behavior, and teacher reports.

Table 2

Summary Report of Individual Participant Evaluation

Number of (26) Participants who Responded to each of Five Possible Ratings.

Forestry Staff Development Evaluation

Stronply Disagree	Disagree	Undecided	Agree	Strongly Agree	
			10	16	1.
			13	13	2.
			4	22	3.
			4	22	4.
			4	22	5.
			8	18	6.

Stronply Disagree	Disagree	Undecided	Agree	Strongly Agree	
			8	18	7.
			10	16	8.
			4	22	9.
			6	20	10.
			4	22	11.
			6	20	12.
			6	20	13.

Group interaction was the fourth goal desired. Students and teachers demonstrated improved communication by the increase of interaction compared to classroom science learning. Teachers reported classroom learning as more passive whereas in the forestry setting, learning was more active and interactive. The communication was task related. Rangers remarked to the writer about the number and level of questions asked by students during the field trips and by the teachers during the inservice training.

The fifth important goal of this practicum was to expose students to the natural environment and by developing an awareness, generate a concern and appreciation for the forest and for its care and perpetuation. Teachers measured this goal by assigning essays about the importance of protecting the forests. According to the teachers, essays assigned to students were more persuasive when addressing environmental issues. Some were described as nearly emotional in their attempts to present the importance of protecting the forests. One teacher reported assigning a slogan competition. The slogans were creative, clever, and provocative according to her opinion. It was evident to this teacher that the students were concerned about protecting the environment and appreciating the beauty of the forest.

The final goal of this practicum was to increase the use of the forest as an educational and recreational facility. Increased use cannot yet be documented on a long range basis. However, an estimated 50% to 70% of the students expressed a desire to return to the forest.

From reports of the teachers and forestry personnel, students appeared to enjoy the field trips and hiking from one site to another

on the demonstration trails. Rangers reported that litter and disturbance of the habitat was minimal. This supports the conclusion of an awareness of the importance of protecting and preserving the woodlands.

Although documentation of increased long range use of the sites cannot yet be provided, the practicum implementation alone involved the visitation of over five hundred fourth grade students with more than twenty teachers. This number is equal to the attendance in the full year preceding the practicum plan. Assuming that the attendance of other groups will be about the same as in preceding years, the number of students benefiting from the educational facility should double. Based on the very positive responses of these five hundred students and their teachers, the impact may be even greater than projected. It has been suggested by the teachers that the standardized field trip be continued on an annual basis and extended to other grade level groups.

Conclusions

According to the above summary, the objectives of this practicum were met. As a result of the implementation, more students utilized the educational center and more learning of ecology concepts was possible.

Forestry personnel also evaluated the practicum plan as a success. According to their letter (see Appendix M) indicating attendance increases as a result of the plan, they deem the experience a successful learning project for the boys and girls of the local

school system.

The standardized field trip with logistics handled at the county level relieved the teachers of the arduous tasks involved in organizing requirements inherent in class trips.

In addition to the many environmental education concepts for students as outlined in the newspaper articles (see Appendix N) fundamental outdoor skills were also developed by the teachers through the experiences. The staff development workshops and field trip caused the ineptness felt by some of the teachers to disappear. The teacher's insecurities expressed by the group of the teachers surveyed was due to their lack of experience in outdoor living and recreation. Basic outdoor skills were a fundamental part of the training. Knowledge of directions and orienteering dispelled the fear of becoming lost. Rudiments of proper attire for hiking to prevent the possibility of discomfort prepared the teachers for a more enjoyable experience. A knowledge of simple first aid for cuts, insect bites, stings, skinned knees, and burns alleviated the uncertainty of being unprepared for the unexpected in a different environment.

Based on pleasurable experiences in the forest, a new respect and confidence developed within each teacher in the forest environment. The new awareness seemed to change anxiety to eagerness. These were the affective objectives of the in-service training along with the cognitive objectives of the curriculum content.

Discussion

In addition to the accomplishment of the anticipated outcomes as discussed above, several unexpected events occurred during the implementation of this practicum. The writer developed a proposal for a minigrant based on the practicum problem. The minigrant had a nearly identical abstract and outline for the proposal. The total grant funding was used to provide substitutes during the staff development activities, pay consultants, and buy the educational materials for the environmental units used in the classrooms previous to the field trips.

Another unanticipated outcome of the practicum was the adoption of a resolution by the local school board to promote the use of the forest facility by all schools in the local system. This resolution (see Appendix O) was intended to make public the value of the facility for its educational assets. It was also intended to encourage the general public and legislature to support the appropriation of continuing funding to further develop the educational trails as an environmental learning laboratory.

Recommendations

Recommendations that might benefit the practitioner of a similar practicum plan in the future include:

1. In-service training should be conducted on site when possible. Training at the site prior to the field trip increased learning opportunities for students because teachers felt more confident as a result of being familiar with the environment.

2. Smaller groups on field trips were more attentive and interactive. Therefore, smaller groups are recommended.

3. Classroom teachers should accumulate more activities to be added to the interdisciplinary science unit they received as a prepatory guide for the field trip. These guides contain planning and teaching concepts generalizable to various areas within the forest. The collection can grow and become a valuable teaching resource for each of the teachers.

In addition to the above recommendations, the following suggestions were offered to the administrators of the local school system for furthering and continuing the solution:

1. Field trips should be continued each year with inclusion of more students.

2. Outdoor education workshops for teachers should be encouraged each year by payment of a stipend for attendance.

3. Perusal of standardized test scores should occur in science to determine if gains are indicated for student participants.

4. Attendance records should be monitored to determine if public attendance increases as a result of publicity.

Dissemination

Plans for disseminating the practicum plan and results include:

1. Presenting a lecture to a science club at a local high school about the practicum and its results as an example of the problem solving process.

2. Writing a synopsis of the plan to be submitted to an outdoor

magazine for consideration of the editorial staff for publication. (An invitation to attempt this writing was issued to the writer of the practicum.)

3. Sharing with a cluster of colleagues the results of the practicum process and the application process for minigrants through National Diffusion Network.

4. Submitting copies to local legislators of the school board resolution and a short synopsis of the practicum plan and results. A local legislator requested that this information be disseminated for consideration in recommending appropriations for continuing funding for the forest facility.

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APPENDIX A

GLOSSARY OF TERMS: NAVAL STORES

NAVAL STORES - FACT SHEET

Crude turpentine or Resin - gummy exudation from a pine tree.

Turpentine or Spirits of Turpentine - distillate of resin.

Rosin - residue left after distillation of crude (resin).

Box or Face - a cavity 3 to 4 inches wide, 6 to 7 inches deep, and 12 inches long cut near base of a tree to collect resin. May be 2, 3, or 4 boxes per tree.

Crop - 10,500 boxes or faces

Drift - subdivision of a crop following topographic or other boundries.

Cornering - removing a triangular shaped chip above each corner of a box. Provides a smooth surface for resin flow.

Chipping - re-exposing cambium layer by cutting a one-inch wide by ½" to 1½" deep streak or gash in tree. Done to increase resin flow.

Dipping - removing resin or gum from box. Done every 3 to 5 weeks, 7 or 8 times each season (mid-March to late October).

Scraping - removing dried resin with a scraper and collected in a scrap box. Generally done at end of season. Yields very inferior products compared with "dip". Many impurities: twigs, bark, insects, etc.

Cup and gutter - alternate method of collecting resin. More effective and efficient than box, cornering and dipping. Purer resin. Cup and gutters moved upward at start of each season. Doesn't injure vitality of tree.

McKay cup - a single rectangular iron or clay cup used to collect resin. Same principle as cup and gutter but all in one piece.

YIELDS

29 to 46 barrels of turpentine (50 gallons per barrel) and 163 to 234 barrels (520 pounds net weight each) of rosin per crop.

8 to 12 pounds per box per year of crude turpentine/resin.

One barrel (50 gallons) of crude yields five gallons of spirits of turpentine and 60 to 65 percent of its bulk in rosin.

Greatest quantity of turpentine used in paints and varnishes. Also used in cloth-printing, solvents for rubber, chemicals, medicines, etc.

Rosin used in roofing materials, lubricating compounds, soaps, sizing paper for printing, linoleum, wax, inks, etc.

"Brewer's pitch" mixed with turpentine used to coat interiors of barrels for beer and malted liquors.

Ancients collected gum and boiled it in big open pots until a thick pitch was left in bottom of pot. They stretched a fleecy sheep skin over top to catch oily vapors that rose and wrung out the wet fleece to recover the oil. Oil used for making many products, one of which was varnish for mummies.

In colonial days, gum (crude turpentine) was cooked down to a thick tar and used to preserve ropes and caulk seams of ships; thus the term Naval Stores.

First tar burners in North Carolina used dead and down wood and lightwood (fat pine) mainly from longleaf pine trees. Wood was cut to easy to handle lengths, piled in a cone shape, covered with dirt to slow combustion and set on fire. Liquid tar oozed from pile to a nearby pit. Pitch was boiled to yield turpentine and tar. (In this portion, pitch and tar are one in the same.)

Open pots were used to cook the resin until about 1834, when the first copper stills were introduced. After that, nearly all naval stores were produced by distillation of crude resin. It yielded a higher quality product and also increased the yield since there was less loss of vapors.

Naval Stores were so important to the colonies, especially North Carolina, that the King of England and the Royal Governor of North Carolina enacted a number of laws to control the trade, protect crown lands and ensure the quality of the product. Gum (resin), tar and pitch even became established as accepted media of exchange in the payment of rent and public dues (taxes).

Scraping Turpentine

North Carolina Collection, The University of North Carolina at Chapel Hill

Parramour, T. (1983) North Carolina, The History of an American State. Englewood Cliffs, N.J.:Prentice Hall,Inc.

"Pitch is made either by boiling Tar in large Iron Kettles, set in Furnaces, or by burning it in round Clay-holes, made in the Earth."

Within a few years after the bounty system became effective, tar, pitch, rosin, and turpentine were among the major North Carolina exports. Production increased steadily, although there were some temporary setbacks caused by wars, falling prices, and other factors. The table below, based on the manuscript customs records in the Public Record Office in London, reveals the volume and value of North Carolina naval stores exports to England in the late colonial period.

Tar ranked first in the value of these shipments, pitch second, turpentine third, and rosin a poor fourth. The average annual value of naval stores exported from the colony in the late colonial period was about £50,000, in addition to the bounties paid.

	Tar and Pitch (bbls.)	*Turpentine (bbls.)*	*Total*	*Value*
1752–53	73,580	10,429	84,009	£42,000
1768–69	116,886	10,793	127,679	73,164
1769–70	62,386	17,428	79,814	39,713
1770–71	84,411	17,955	102,366	27,922
1771–72	111,967	15,202	127,169	63,324
1772–73	105,581	11,647	117,228	56,923
1773–74	84,048	18,891	106,049	53,098
1774–75	66,232	30,031	99,703	49,345
1775–76	106,086	73,043	179,129	94,003
1776–77	3,706	10,704	14,410	8,275

APPENDIX B

INCOME STATISTICS

PER CAPITA INCOME FOR BLADEN COUNTY AND NORTH CAROLINA

YEAR	BLADEN COUNTY	NORTH CAROLINA	COUNTY INCOME AS A PERCENT OF N. C.
1958	$ 909	$1,420	64.0
1962	1,072	1,732	61.9
1966	1,364	2,277	59.9
1970	2,227	3,252	68.5
1974	3,310	4,616	71.7
1978	4,734	6,640	71.3

Sources: North Carolina Department of Administration, Statistical Services Section, Budget Division, Profile North Carolina Counties, 1975 and 1977; and North Carolina Department of Revenue, Division of Tax Research.

PER CAPITA RETAIL SALES FOR BLADEN AND SURROUNDING COUNTIES

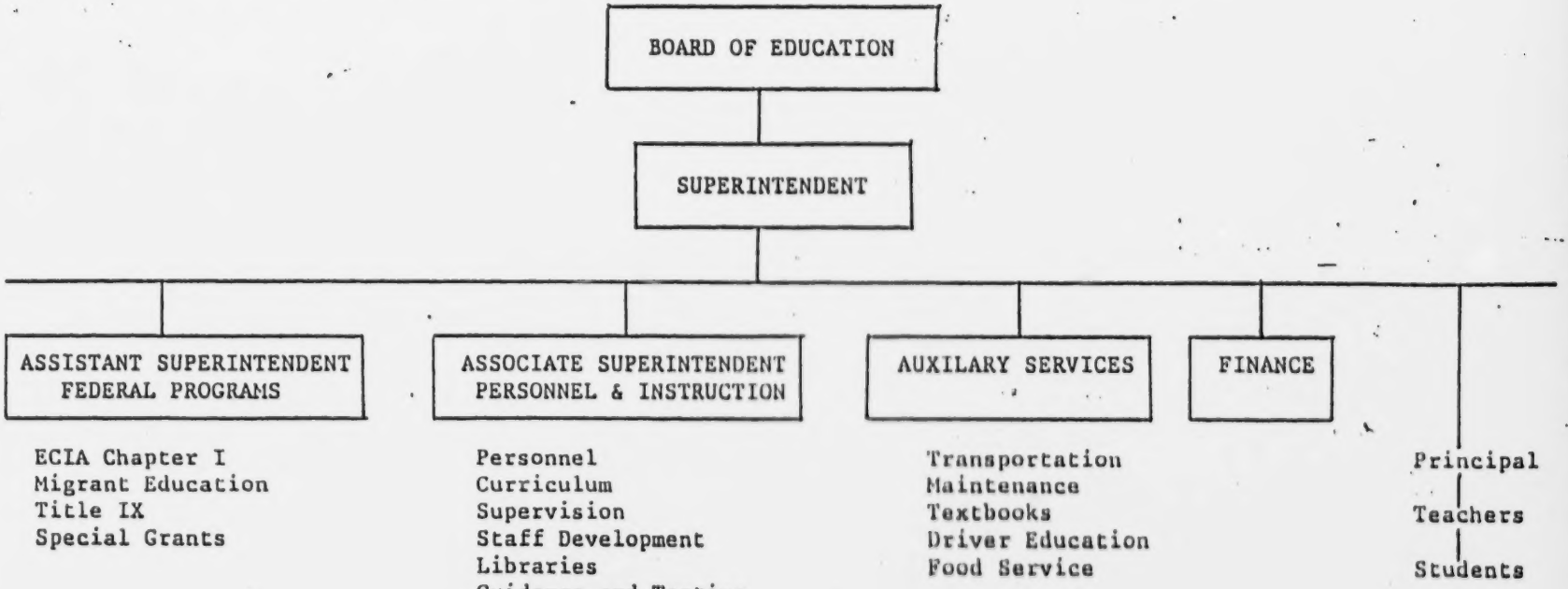
COUNTY	1970 POPULATION	1969-70 TOTAL RETAIL SALES	PER CAPITA RETAIL SALES	1980* POPULATION	1980-81 TOTAL RETAIL SALES	PER CAPITA RETAIL SALES
Bladen	26,477	$ 37,102,903	$1,401	30,069	$ 90,005,422	$2,993
Columbus	46,937	78,138,451	1,665	51,015	241,729,320	4,738
Cumberland	212,042	376,353,439	1,775	245,933	1,048,637,652	4,264
Pender	18,149	19,065,340	1,050	22,107	60,126,633	2,720
Robeson	84,842	142,936,165	1,685	101,498	389,668,466	3,839
Sampson	44,954	66,904,241	1,488	49,243	215,441,918	4,375
North Carolina	5,082,059	11,264,972,238	2,217	5,843,665	36,887,411,823	6,312

*Preliminary counts of the U.S. Census.

Sources: N. C. Department of Revenue, Division of Tax Research; U. S. Census.

APPENDIX C

JOB DESCRIPTION


BOARD OF EDUCATION
SUPERINTENDENT
ASSISTANT SUPERINTENDENT FEDERAL PROGRAMS
ASSOCIATE SUPERINTENDENT PERSONNEL & INSTRUCTION
AUXILARY SERVICES
FINANCE
ECIA Chapter I
Migrant Education
Title IX
Special Grants
Personnel
Curriculum
Supervision
Staff Development
Libraries
Guidance and Testing
Exceptional Children
Vocational Education
Pupil Personnel
Transportation
Maintenance
Textbooks
Driver Education
Food Service
Principal
Teachers
Students

TITLE: Supervisor - Grades 4-8

SUPERVISES: Professional Staff - Grades 4-8

JOB GOAL: To ensure that each elementary school student is provided with the richest educational experience the school system can provide.

Percentage of Time Spent:	PERFORMANCE RESPONSIBILITIES:
10%	1. Guides in planning and development of a program of instruction at assigned grade levels--coordinating with grades below and above.
5%	2. Provides leadership and direction to the elementary school administrators and teachers.
5%	3. Participates in the evaluation of elementary instruction methods and programs and recommends such changes and improvements as are needed.
2%	4. Assists in planning and supervising the instructional orientation program for new elementary teachers.
5%	5. Evaluates, selects and distributes instructional materials to elementary teachers and administrators.
3%	6. Consults with principals in the evaluation of teachers.
3%	7. Works toward developing an improved understanding of children's educational needs on the part of teachers, administrators and parents and interprets the educational progress of elementary school students to them.
3%	8. Assists in coordinating the selection, utilization and maintenance of elementary school textbooks and other instructional materials.
3%	9. Initiates and maintains effective liaison with program services from state department, regional center and other school districts in order to keep school personnel aware of new developments and ideas in education.
2%	10. Secures innovative curricula developed outside local unit, adapts curicula to meet the needs of students or student groups, and makes them available to local personnel for use in guiding instructional planning.

3%	11.	Arranges for production of the necessary learning materials to complement, fulfill, and/or enhance the aims of the curricula.
2%	12.	Prepares and justifies budgetary recommendations to secure financial support for certain educational program needs.
5%	13.	Handles the budgeting of a locally allocated fund to provide instructional materials in designated curricula areas for elementary grades.
5%	14.	Serves on various committees, task force groups, planning teams, etc., within the local unit and outside the unit which contribute to policy-making curriculum determinations program design, etc., which affects elementary schools.
2%	15.	Works with certain community groups or agencies to provide meaningful experiences for students in elementary grades.
2%	16.	Participates in variety of district, state, and national professional organizations devoted to the advancement of elementary school education.
60%		

TITLE: Staff Development Coordinator

REPORTS TO: Associate Superintendent/Superintendent

JOB GOAL: To assist members of the staff to achieve the objectives of the school and administrative unit; and at the same time to assist individual members to achieve their own personal objectives.

Percentage of Time Spent:	PERFORMANCE RESPONSIBILITIES:
5%	1. Considers the assignment as coordinator of all staff development activities in the administrative unit as high priority responsibility.
5%	2. Assumes responsibility for an overall in-service education program which is planned and implemented through strategic activities designed to meet needs identified in the Comprehensive Educational Plan of the administrative unit.
2%	3. Works with Staff Development Committee composed of representatives from all schools (teachers and principals) to plan and evaluate the overall in-service program and its components.
5%	4. Works with the administrative and supervisory staff to plan in-service activities which will be suitable in terms of logistics--dates, times and location.
3%	5. Uses the in-service money from the Division of Staff Development, State Department of Public Instruction and from local budget for programs applicable to both specific areas and general education.
5%	6. Keeps account of expenditures and assumes responsibility for securing reimbursement or payment for services from the proper source.
5%	7. Arranges for securing the services of a variety of consultants and resource people, either from within the school unit or from outside, who can contribute to the implementation of an in-service plan.
5%	8. Coordinates efforts of staff concerned with various facets of the educational program to design, adopt, and conduct training sessions to meet the needs of a given staff group in terms of preparation for any projected changes in the curricula, organization, facilities, media and materials, or strategies and methodology.
5%	9. Participates in the development of in-service programs which will provide opportunities for a given staff group to participate in activities leading to initial certification, renewal of certificates, and general upgrading of competencies in their respective areas of education.
40%	

JOB DESCRIPTION OF THE GENERAL SUPERVISOR

REPORTS TO: Superintendent or his/her designee

SUPERVISES: May supervise other instructional and auxiliary personnel when appropriate

PURPOSE: To provide leadership and assistance in the development, implementation, and coordination of the local school program

DUTIES AND RESPONSIBILITIES:

A. MAJOR FUNCTION: Instructional leadership

The supervisor participates in the development of systemwide instructional goals. The supervisor provides services to assist in the development, implementation and evaluation of the instructional program.

B. MAJOR FUNCTION: Management

The supervisor manages budgets, reports, resources, and personnel as assigned.

C. MAJOR FUNCTION: Promoting Relationships

The supervisor promotes positive relationships among school personnel and with the community.

D. MAJOR FUNCTION: Staff Development

The supervisor ensures that staff development activities are appropriate to meet the needs of staff members. The supervisor may conduct, evaluate and/or coordinate such activities.

E. MAJOR FUNCTION: Professional Development

The supervisor exhibits professional ethics, upgrades professional knowledge and skills, and complies with established policies, laws and regulations.

APPENDIX D

FORESTRY CURRICULUM MATERIALS

State of North Carolina
Department of Natural Resources and Community Development
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Harry F. Layman
Director

Bladen Lakes State Forest
Route 2, Box 942
Elizabethtown, N.C. 28337

April 22, 1987

Mrs. Ann Elks
Board of Education
P.O. Box 37
Elizabethtown, N.C. 28337

Dear Mrs. Elks:

The purpose of this letter is to grant you permission to use the book, Discovering the Forest as a part of Bladen County Schools Environmental Plans in any way it will benefit the students.

Gene W. Kinlaw

Gene W. Kinlaw
Assistant Forest Supervisor

GWK:pr

Discovering the Forest Instructors Activity Packet

The North Carolina Division of Forest Resources has developed this program to encourage individuals and groups to visit the Small State Forest and to participate in environmental education. The fundamental basis of this "Discovering the Forest" activity packet is to stimulate environmental sensitivity through an appreciation and understanding of the forest environment.

The activities provided in this packet are broadly based so that you can tailor them to your needs. They are designed to be used in one of our state forests, where, for your convenience, the following facilities have been provided.

Facilities:

- Picnic tables with grills
- Group shelter with fireplace/grill
- Restrooms
- Water fountains
- Bus parking
- Office for assistance and informational materials

Educational Facilities:

- Forest Exhibit Center (exhibits & displays)
- Outdoor exhibit stations
- Orientation display
- Talking tree trail (45 min. walk)
- Forest demonstration trail (2 hr. walk)
- Study sites (for use with selected activities from packet)
- Amphitheatre
- Tree identification signs

NOTE: See map for location of facilities

Using Activity Packet:

When you have the opportunity to study the forest by being there, the discovery process becomes more important than the conveyance of information. This can be accomplished with these activities by allowing individual and group participation to direct the activity, using the discussion questions to generate more questions, and allowing for the spontaneity that a complex environment like a forest offers. Although many of the activities encourage the participants to find and touch miscellaneous materials, it is important that they realize that none of those materials are to be removed, but must remain in the forest for the enjoyment of those who follow. The activites are designed to be used by age groups from kindergarten through adult. The upper right hand corner of each activity suggests the appropriate age group. Use this packet and plan your visit; you may want to make it a short trip or a full day experience.

Develop and Confirm a Schedule for the Day:

Organizing your schedule will allow the Forest Rangers to prepare for your visit. Please call ahead for reservations and assistance in planning. The Forest Supervisor can assist you in developing a learning experience to fit your needs. Since several classes visit the Forest each day, the earlier you can confirm your schedule the better. To give you some idea for developing your own schedule this example is offered.

9:15	Arrive at Forest; one-half picnic shelter reserved
9:30 - 10:00	Organize; in picnic shelter
10:00 - 10:15	Break
10:15 - 11:00	Walk talking tree trail
11:00 - 11:40	Forestry study site 1 - Activity (from packet) *Story in a Tree Stump*
11:40 - 12:30	Lunch
12:30 - 1:00	Amphitheatre - outdoor mathematics (teacher developed activity)
1:00 - 2:00	Forestry study site 1 - Activity (from packet) *Drawing a Forest Map*
2:00	Return to School

Visit the Forest Before Bringing Your Class

It will be desirable that you visit the forest before you bring your class so as to become familiar with facilities.

Visit As One Class

Often two or more teachers may want to bring their classes as a group. However, it is better to plan, schedule, and reserve the day as separate classes.

Teachers Are Responsible for the Discipline of Their Students

During the fall and spring more than one class will often visit the Forest during the same day. It is best not to have one class "running free" while other teachers are trying to conduct classes. We simply ask that the students be kept under reasonable control.

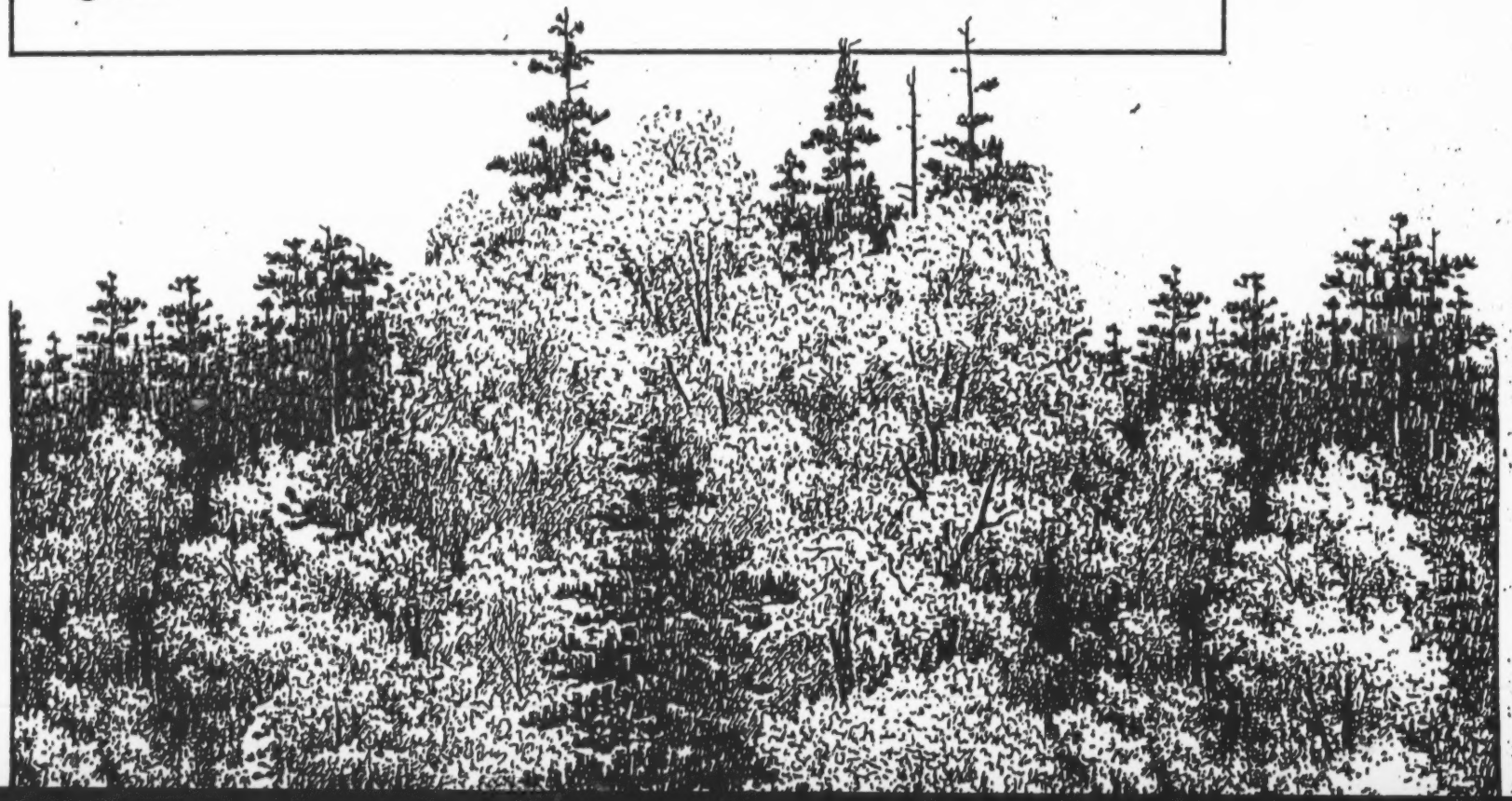
Reservations

The picnic shelter can be reserved, but since there are several picnic sites available, it is not necessary to always reserve the shelter. Reservations can be made by contacting the Forest headquarters. All reservations are on a first come-first serve basis, so the sooner you call the better your chances will be in getting the picnic shelter.

FOR RESERVATIONS AND INFORMATION IN PLANNING YOUR VISIT PLEASE CALL THE STATE FOREST NEAREST YOU

FORESTS

This series of activities will enable the student to recognize the structure of a forest by studying an individual tree or a particular forest environment. Land use and conservation are other factors that are stressed along with questions such as how and why trees grow.



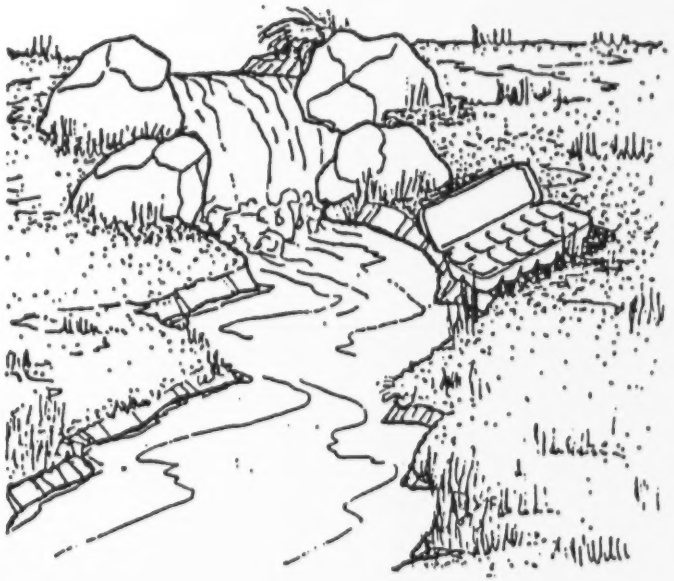
59

Discovering The Forest

out-of-place

K thru 5

PREPARATION Before meeting with students, set up the trail in a study area or along an existing trail. Along the path, locate objects out of their usual context. I.e. apple in a dogwood tree, berries in a pine tree, tin can on trail, damp area on dry ground in the sun, etc.



ACTIVITY Tell the group you have made changes along the trail. Explain that the students will be hunters looking for out-of-place objects, and marking them on their paper. (pictures can be prepared ahead for young children) All discoveries should be kept secret until the game is over.

VARIATION: Have the students place the objects for another group to find.

FOLLOW UP Which things would be out of place in the city? parking lot? school?

Discovering The Forest

communal poem

thru A

MATERIALS paper, pencil

ACTIVITY

1. Go to a quiet study site in the forest. Divide into 6 to 10 member groups.
2. Disperse each group throughout the study site allowing each to select a natural object for them to focus their attention; to *really* experience.
3. The group should look at the object closely, touch it, listen to it, taste it (if this applies, ex. bark, root, etc.) smell it (again, if this applies), walk around it, and observe it from all angles, stand back from it, etc., etc.
4. Have each group member write two things about the object. This can be a feeling he or she has about the object, something the object made the person think about that may be either directly or indirectly related to the object, an observation the person made about the object, or it can be a description about one moment of the person's experience during the communion period. For example, (using a tree): "I felt its bark" or "MY fingers broke the slender twig."
5. The leader/teacher should give each group a limited time (7 to 10 minutes) and can either choose to conduct the "study time" in complete silence or not.
6. Collect all the written thoughts from the group members and read in a series forming one community/communal poem.
7. Have a member from each group present their communal poem to the other groups.

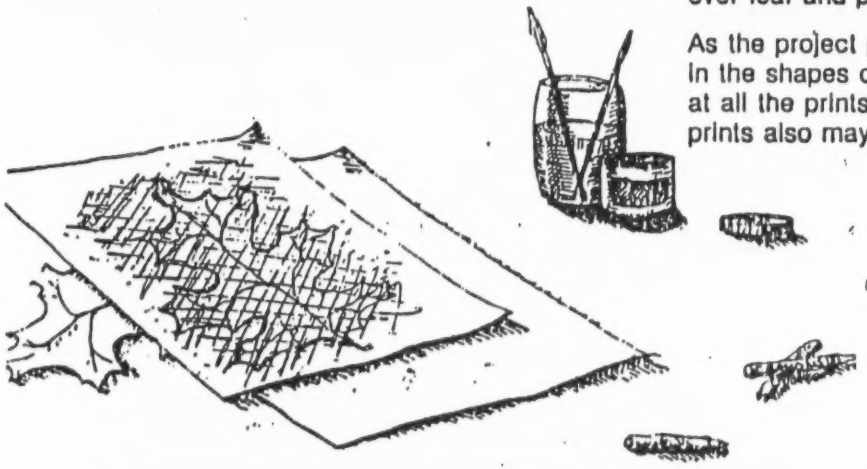
leaf print

K thru 5

SUN PRINTS MATERIALS plastic wrap, hydrogen peroxide, blue print paper, tub

ACTIVITY I Put a few drops of hydrogen peroxide in a tub of water. In the shade of your body, arrange organisms and objects on blueprint. Cover them with plastic wrap to hold them flat on the paper. If they are wet, also place plastic wrap underneath them. Step aside and allow sunlight to expose them for 40 - 60 seconds. Plunge the paper in the tub of water for at least one minute. Remove and allow to dry in the shade.

Try a sun print of forest trees. Include at least three types of leaves. Make a sun print of soil habitat. Include plants, animals and nonliving objects.



CRAYON RUB MATERIALS crayons, paper

ACTIVITY II Have Students gather leaves from the ground. You might suggest they "Find a leaf that looks like your hand", or "Find leaves with sawtooth edges." Have each student lay a leaf down. Place a sheet of paper on top of it, and use the side of a crayon to rub across the leaf. Some students will need to be encouraged to color over the entire leaf, rather than only part of it. A dark crayon will produce a clearer print. A good crayon rub will show veins of leaves as well as outline.

LEAF PRINTS MATERIALS plastic, metal, or wire screen, toothbrush, straight pins, tempera paint, paper

ACTIVITY III Have students collect a variety of leaves from the ground. Place a leaf on a sheet of paper and secure with pins. Place screen over leaf and paint across the screen.

As the project progresses, talk with students about the differences they see in the shapes of the leaves being used. As a follow up, have the class look at all the prints and group together those with leaves of similar shapes. The prints also may be used to identify leaves outdoors.

Discovering The Forest

study the forest floor

4 thru A

MATERIALS pencil, paper

ACTIVITY

1. Go to a study site. Divide into groups of four.
2. Scatter groups throughout study site. Have each group identify their forest floor by facing each other, stretching out their arms and joining hands. The space between the four will be the area of study.
3. Have the group to sit in their area.
4. DO NOT DISTURB THE FOREST FLOOR. Without moving anything within their square have them record the amount of material on the ground, the different types of natural objects, the different forms and arrangements, the living and dead material, the solid and soft objects, the decaying material, have the group to make a drawing of their study area.
5. Reassemble the groups and have each to show their drawings and to tell what was in their space.

FOLLOW-UP Repeating the same exercise, visit another type of plant community and note the difference, for example, compare the forest floor of a pine forest with that of a hardwood forest.

Discuss why the forest floor is so important.

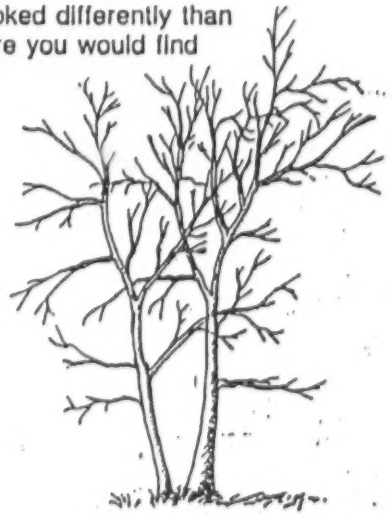
Discovering The Forest *picture bingo*

K thru 5

PREPARATION Plan a class project in which each student will draw pictures of some natural features in the forest (see list). Encourage them to think of others. It will be their decision which ones to choose, and whether they think they will find them in the forest. Lay each drawing on one of the square of the grid, which may contan from 9 - 40 squares. Young children may need outlines to draw from. Take crayons and each student's bingo card (grid with pictures) on the trip.

ACTIVITY Decide on a stopping time for this activity because it will happen all during the visit. Any time that a student sees something on his bingo card in the forest, she/he may mark off that square. At the decided time, see who has filled out the most squares and who has bingo.

FOLLOW UP Discuss how the natural features looked differently than they had imagined. Looking back at the list, discuss where you would find those things not found in the forest.
Example *pigeon - city



*fallen log
rock
flower
bare ground
stump
pine tree
*street
leafy tree
  sweet gum
  holly
  poplar
  oak
  maple
  *palm tree
mountain
bird
  *eagle
  cardinal
  blue jay
  *pigeon
  woodpecker
  robin
  crow
  squirrel
*goat
snake
  black
  garter
  copperhead
turtle
cactus
toad
frog
*cow
salamander
lizard
stream
lake
*salt water
fountain
bench
picnic table
wet ground
poison ivy
hill
*sidewalk

Discovering The Forest

People used to stalk animals in the wilderness. To do that they had to be very observant and very quiet. These activities provide practice in looking for clues in the forest.

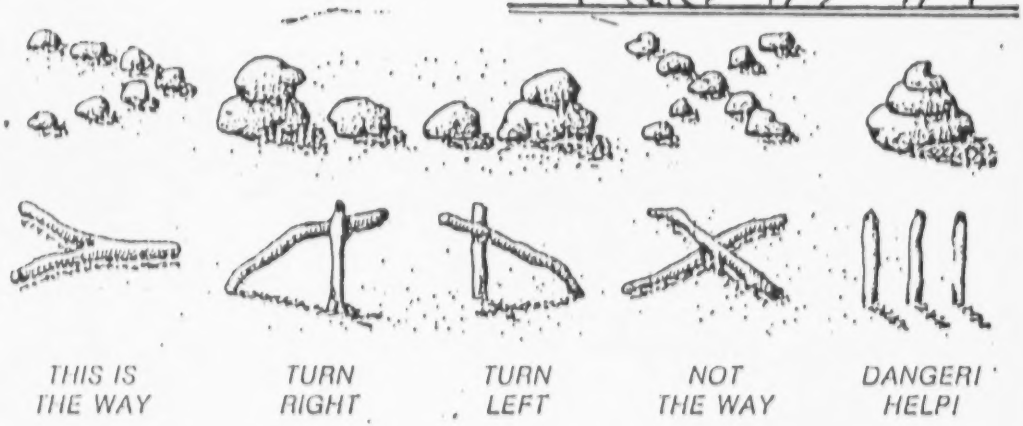
ACTIVITY I Indians used sticks or stones as signs to their friends to follow a trail (see illustration right). Divide into small groups and have groups use either the stick or stone method. Have each group try to follow a trail made by another group. Or, send one small group ahead to make a trail. After waiting for them to get a head start, see if the rest can follow their trail and find them.

ACTIVITY II Scout trail signs are scratched in the ground with the point of a stick. Prepare messages (poems, Indian tales, stories, etc.) before going to the forest. When you arrive, try this sign system on one of the trails. Have different groups prepare messages for each other, and follow each other's trails to find the messages.

THIS IS THE WAY *MESSAGE 3 STEPS THIS DIRECTION* *NOT THE WAY*

trailing

1 thru 6



THIS IS THE WAY *TURN RIGHT* *TURN LEFT* *NOT THE WAY* *DANGER! HELP!*

ACTIVITY III This is a game called deer stalking. Designate one student as the deer. The rest of the group will walk away in different directions about 200 ft. and fall down. On signal, the students start moving toward the deer, using whatever cover is available to hide themselves. When the deer sees a student, he yells to him to stand up. The student who comes closest without being seen becomes the next deer.

FOLLOW UP Can you think of another signal system to use in the forest?
What evidence of animals did you observe? (homes, tracks, etc.)
Did the color of your clothing or message make a difference in your being seen?

Discovering The Forest

textural trail

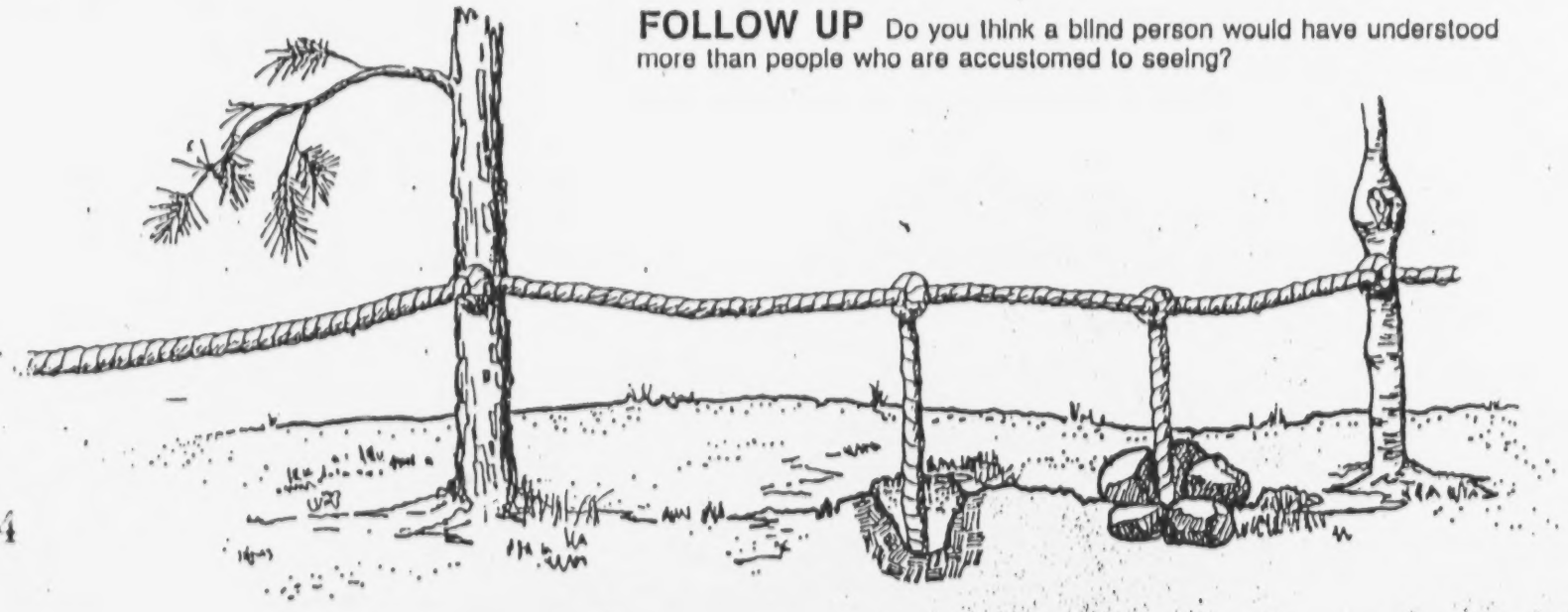
1 thru A

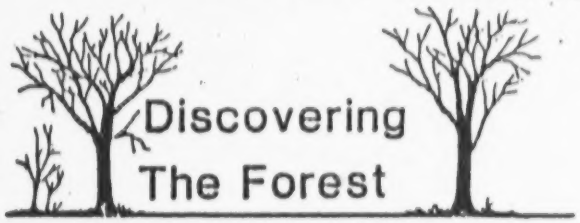
MATERIALS 100' - 200' of rope
blindfolds

PREPARATION Either plan a class project to make blindfolds or use scarves for blindfolds. Prepare the rope for this activity in a place on the trail which will utilize a variety of textures of tree bark as well as objects on the ground.

ACTIVITY The purpose of the textural trail is to provide the experience of sensing the forest through hearing, feeling and smelling, rather than just by seeing as we usually do. The trail consists of a rope with knots located at objects to feel. Put blindfolds in place when you reach the first marker of the trail. Allow the children about 20' to adjust to walking blindfolded. Young children might wish to travel the trail with a sighted partner and then switch roles. Explain that they are to find many varied textures, some they will recognize and others they will not. It is also important to emphasize the importance of being quiet in order to concentrate on sound in the forest.

FOLLOW UP Do you think a blind person would have understood more than people who are accustomed to seeing?





language art

2 thru 6

ACTIVITY I Have the students wander around one of the study sites for fifteen minutes and look for an object about which they can make up a story. Perhaps it is a rock, a leaf or a tin can. Gather together, with each person having a chance to relate to the others in the group through his object. Be sure to return natural objects to the forest.

ACTIVITY II Allow students to go into the forest and find their own quiet spots. They should remain there for a specified time to think about their place in the forest and what is special about the spot they chose. Gather together and allow each person to share his thoughts. (The option is not to share one's thoughts.) Ask one student to take another to the first person's favorite spot. Have the students describe what they liked about their friends' favorite spots.

ACTIVITY III Divide into small groups at a study site and allow each group to choose an activity to prepare for the rest of the class.

List 10 to 15 adjectives that could be used to describe a tree. Use the words to write a poem or short story about the tree.

ACTIVITY IV Take a tree to lunch. While eating, consider the answers to these questions. What is it like under the tree? What animals visit the tree? Is the tree getting help from people? Are people damaging the tree? What does the tree do for people? Has the tree cast seeds? Are there any small seedlings near the tree? Is the tree crowded by other trees or buildings? Describe your tree so that someone else could recognize it.

ACTIVITY V Take the students to a study site and ask them to sit quietly under a tree. Suggest they close their eyes. Ask them some questions. What can you hear? How is the sound made? Can you imitate a sound like that? Can you make the sound as it is actually produced? Try this at the school grounds when you return and compare the sounds.

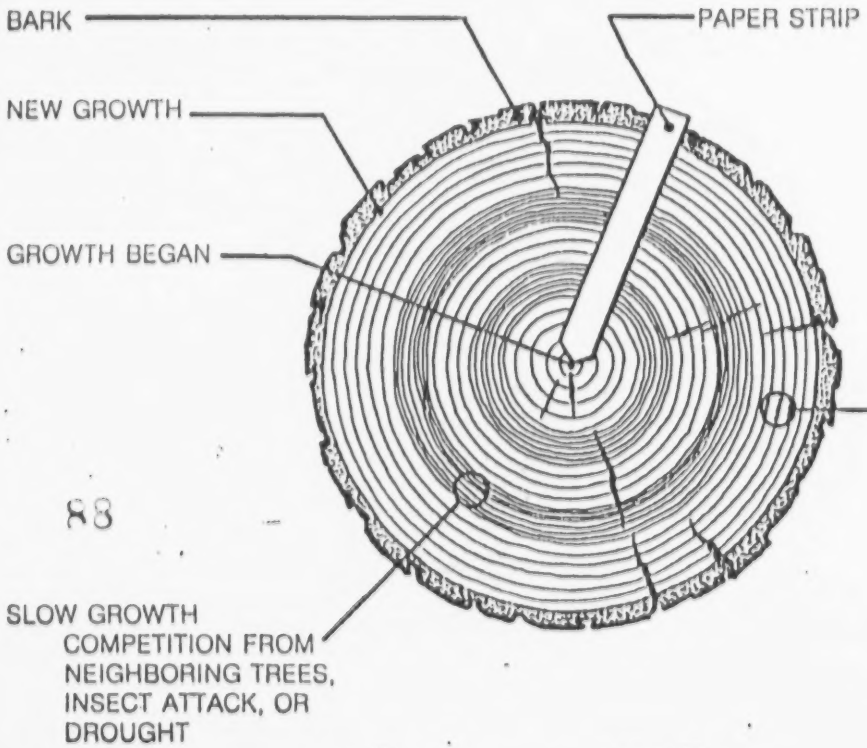
Discovering The Forest

ring counter

2 **thru** A

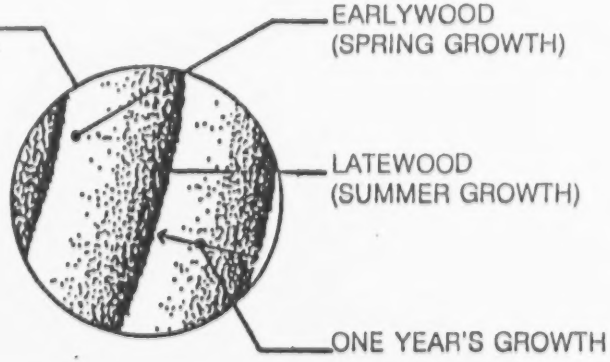
MATERIALS pencil, paper, tape

PREPARATION The rings of a tree provide many clues to the history of the forest in which it grew. Determine the age of the tree by marking the growth rings on a paper strip.



ACTIVITY Discuss the concepts outlined in Preparation. Divide into small groups of about five persons. Assign each group to a "ring count stump" in a study site at the forest. Ask the participants to answer the following questions.

What kind of tree was it? (deciduous, coniferous, or can you name the tree)
How old was the tree?
Why are the rings different distances apart?
At what time of year do you think the tree grew the most?
At what age was the trees growth the slowest?
How many years did the slow growth last?
Following this slow growth was there an increase in the growth rate? Why?
How old was the tree when you were born?



Discovering The Forest

seed-go bingo

3 thru 6

MATERIALS Prepare seed-go bingo cards for each group. This activity should be planned for the fall season.

ACTIVITY I Explain that all plants make seeds in order to reproduce themselves. These seeds must somehow leave the plant and grow somewhere. Tell the group that not all seeds grow where they fall. Look carefully at the plants in the forest. Discuss how each plant disperses seeds. Divide into groups with seed-go cards. Look for seeds that fit the boxes; remember some may be dispersed in more than one way. Four seeds in a row in any direction, wins. Have teams explain to others where they found their seed and how they were dispersed.

	WIND	WATER	ANIMALS	MAN
DECIDUOUS TREES				
EVERGREEN TREES				
BUSHES				
WEEDS				

FOLLOW UP Give everyone several bean seeds and let them use classroom materials to see if they can:

Modify their seed to float on water for five minutes.
Modify their seed with a mechanism that will throw the seed two feet away from the parent plant.
Modify their seed to attract a bird or other animal. Modify their seed to hitchhike for 20' on an animal or person.
Modify their seed to fly three feet.

ACTIVITY II In one of the places where you found hitchhiking seeds, let the children run around the area for a specified time, and then count to see whose clothes picked up the most seeds. Why should some clothes pick up more seeds than others? Which animals would pick up seeds? Which kinds of seeds are picked up the most? (Look for lespedesa) What mechanism enables them to do that better than other hitchhiking seeds?

Discovering The Forest

leaf chart

4 thru A

MATERIALS paper, pencil, or crayon

ACTIVITY Select several different types of leaves found lying on the ground (please do not pick green leaves from the trees).

Make drawings of the different leaves and record the data, such as vein patterns, shapes, its length, width, and color. Also note the type of environment in which the plant was growing.

NOTES

COLOR
LEAF MARGIN
LENGTH OF LEAF
WIDTH OF LEAF
SIZE OF TREE
GROWING ENVIRONMENT

Discovering
The Forest

how tall is a tree?

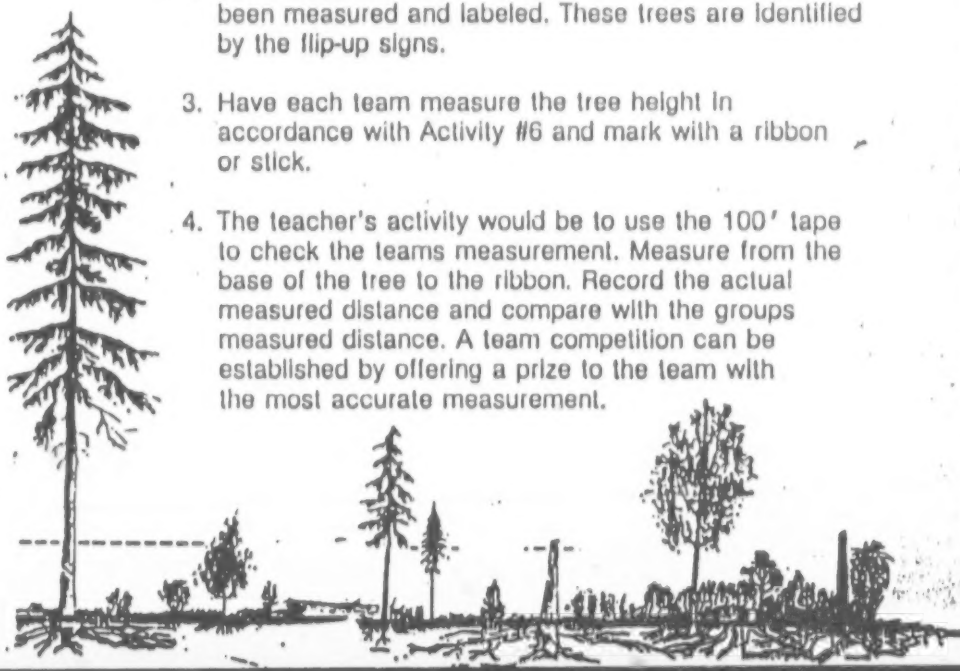
7 thru A

MATERIALS flagging ribbon; 100′ measuring tape

PREPARATION Discuss with the class that treescan be very tall but a person's eyes have difficulty perceiving tall objects. Measuring the tall object along the ground presents a very different viewpoint. Refer to Activity #6, Measuring Heights.

ACTIVITY

1. Divide into teams of three to five members.
2. Have each team select one of the trees that have been measured and labeled. These trees are identified by the flip-up signs.
3. Have each team measure the tree height in accordance with Activity #6 and mark with a ribbon or stick.
4. The teacher's activity would be to use the 100′ tape to check the teams measurement. Measure from the base of the tree to the ribbon. Record the actual measured distance and compare with the groups measured distance. A team competition can be established by offering a prize to the team with the most accurate measurement.



FOLLOW-UP Following activity, return to the study site opening, discuss tree growth. For example:

It took 50 years or more for the trees to grow as tall as they have. Some trees can increase their height two or three feet each year, while other trees will hardly grow at all. What do you think affects how tall a tree grows? The kind of tree is one reason. Some trees grow short and crooked, others tall and straight.

Other reasons are:

The amount of sunlight, it may be crowded by other trees;
The lack of enough water, or too much water;
The tree may have been damaged, by man or nature;
The tree may be affected by diseases;
The tree may be affected by insects;
Air pollution could damage the leaves so the tree cannot make enough food for itself;
The tree may be old; the tree may be young - as trees get older they grow slower.

How a tree grows can be affected by many different things.

GRADE:

4-Adult 1. OUR PRODUCTIVE FOREST - The objective of this program is to inform students of the economic and environmental importance of North Carolina's forest resource. To accomplish this, the importance of forest management will be stressed; the stumpage value of 1 ACRE will be shown and the use of the Biltmore Stick. Many forestry facts of North Carolina will be presented also. This program is done in the "Measurement Area" of the Forest Demonstration Trail and lasts approximately 40 minutes.

2-Adult 2. MEET YOUR TREE - The objective of this program is to acquaint the student with the most common forest trees; to help him appreciate the fact that trees are useful as well as beautiful; and possibly to inspire him to further studies of the management, wise use, and development of the forest resource. Loblolly pine (the state tree) is the species being "met" now and this program is given in the picnic area parking lot. Time: 25 minutes. Yellow Poplar is offered for 1983 also.

K-Adult 3. TREE RING - The objective of this program is to acquaint the student with tree growth rings (what they are, and what we can tell from them). Students learn the parts of a tree and how they grow along with how foresters use tools to tell a tree's age. This program is given at the amphitheatre or Study Site #2. Time: 30 minutes.

4-Adult 4. NEW FORESTS FOR WILDLIFE - One method of managing forests - even-aged management - has proven especially beneficial to wildlife. This program explains what this system means to forest wildlife. This program will explain: what even-aged management is, the managed forest cycle and even-aged management advantages to wildlife. Time: 35 minutes.

1-Adult 5. PREDATORS AND THEIR PREY - As a result of this activity the student will: Gain an understanding of the role of predators in maintaining balance in natural populations, be able to explain the benefit of predation to prey species and vice versa and be able to explain the role of human harvest of wildlife in relation to population control. This activity is done next to the picnic shelter. Time: 25 minutes.

GRADE:

K-3 6. TRUE STORY OF SMOKEY BEAR - Student will learn the true story of Smokey Bear and what Smokey means to us. Student will learn that keeping careless use of fire out of the woods is everybody's job. It's up to them to be careful and to make sure others are careful too. This program is usually done at the picnic shelter. Time: 20 minutes.

3-Adult 7. N.C.F.S. FOREST RANGER - To acquaint the student to the fact that Forest Rangers are responsible for informing, advising and assisting forest landowners in the proper management of our state's forest resources. Excellent "Career Day" program. Time: 30 minutes.

4-Adult 8. FOREST WATER INVESTIGATION - To teach student what a Forest Watershed is through lecture, demonstration and practical exercises. Also, to teach how a Forest Watershed influences a forest community and water quality. This program is given at the Watershed Loop portion of the Demonstration Trail and/or the pond. Time: 30 - 45 minutes or 1 - 4 hours if complete investigation is done.

4-Adult 9. FOREST SOILS INVESTIGATION - Through this activity, the student will gain a general feel for how various elements of the environment work together. This activity will help students to look at soil and help them realize that there is much to learn from it. Student will learn about the formation and components of soil. Time: 30 - 45 minutes or 1 - 4 hours if complete investigation is done.

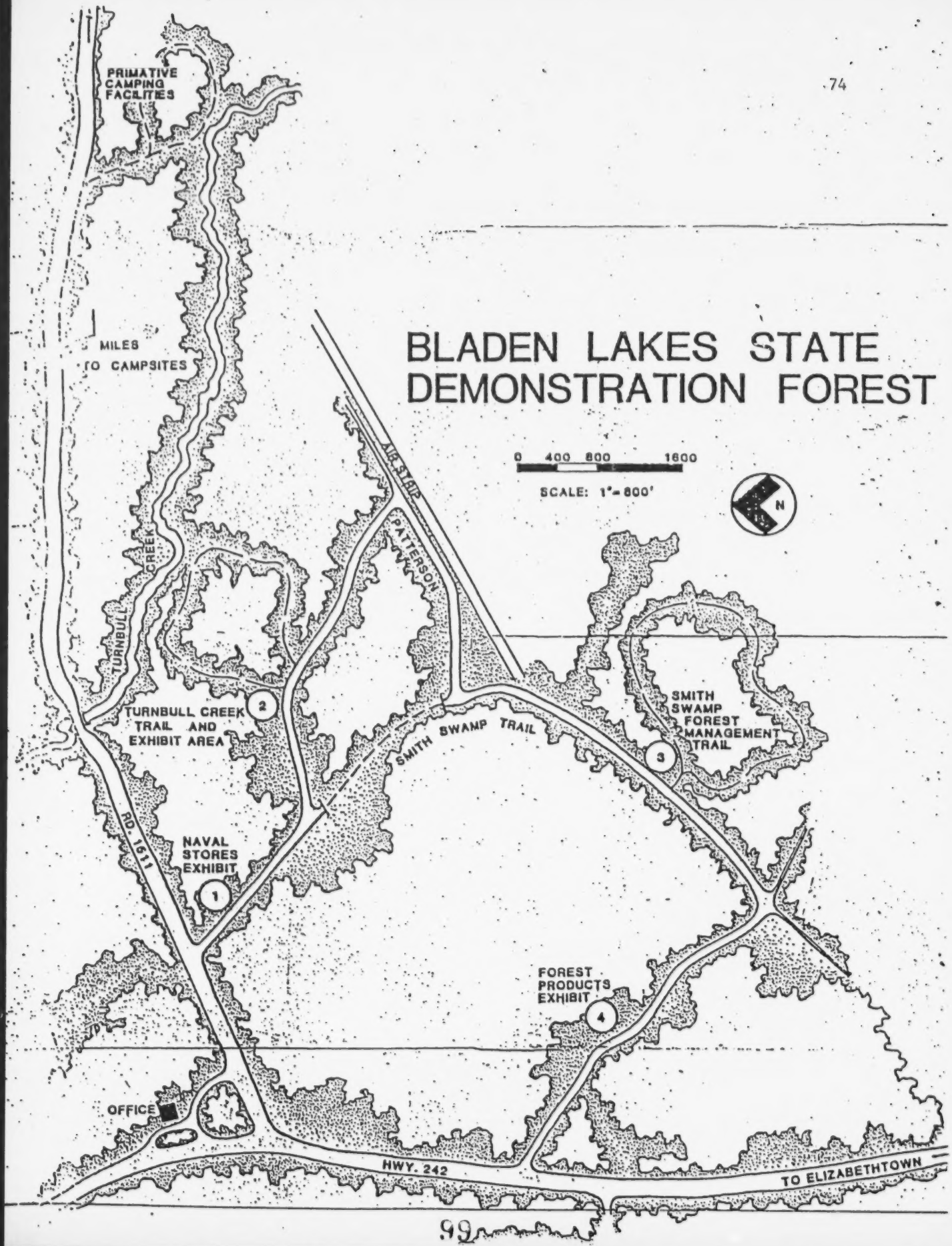
3-Adult 10. HOW PAPER COMES FROM TREES - The objective of this program is to inform students of the history and economic importance of the paper industry to N.C. and that unlike coal or oil, trees give N.C. a renewable natural resource. This program is given in the Measurement Area of the Forest Demonstration Trail and lasts approximately 35 minutes.

3-Adult 11. WHAT WE GET FROM TREES - The objective of this program is to increase the students awareness of the many common and uncommon products that come from a tree. This program can be presented anywhere on the forest and lasts approximately 25 minutes.

K-2 12. FOREST LIFE GAME - The purpose of this activity is to teach younger students the uses of trees and the importance of forest management through a game. This activity is done next to the picnic shelter and lasts 20 minutes.

APPENDIX E

MAP


BLADEN LAKES STATE
DEMONSTRATION FOREST
PRIMATIVE
CAMPING
FACILITIES
MILES
TO CAMPSITES
0 400 800 1600
SCALE: 1"=800'
N
AIR STRIP
PATTERSON
TURNBULL CREEK
TURNBULL CREEK
TRAIL AND
EXHIBIT AREA
2
SMITH SWAMP TRAIL
SMITH
SWAMP
FOREST
MANAGEMENT
TRAIL
3
RD. 1611
NAVAL
STORES
EXHIBIT
1
FOREST
PRODUCTS
EXHIBIT
4
OFFICE
HWY. 242
TO ELIZABETHTOWN

APPENDIX F

ATTENDANCE RECORDS

State of North Carolina
Department of Natural Resources and Community Development
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Harry F. Layman
Director

Bladen Lakes State Forest
Route 2, Box 942
Elizabethtown, N.C. 28337

September 3, 1986

TO WHOM IT MAY CONCERN:

The number of Bladen County students attending Bladen Lakes Educational State Forest for tours in fiscal year 1983 - 1984 was 537.

The number of Bladen County students attending Bladen Lakes Educational State Forest for organized programs in fiscal year 1984 - 1985 was 564.

Gene W. Kinlaw
Gene W. Kinlaw
Assistant Forest Supervisor

GWK:pr

P.O. Box 27687, Raleigh, North Carolina 27611-7687 Telephone 919-733-2162

An Equal Opportunity Affirmative Action Employer

APPENDIX G

FORESTRY ADMINISTRATIVE SUPPORT

State of North Carolina
Department of Natural Resources and Community Development
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James C. Martin, Governor
S. Thomas Rhodes, Secretary

Harry F. Layman
Director

Bladen Lakes State Forest
Route 2, Box 942
Elizabethtown, N.C. 28337

September 3, 1986

TO WHOM IT MAY CONCERN:

Bladen Lakes Educational State Forest is designed to accomodate K-16 level students, as well as the general public, in all areas of environmental education. Environmental education covers general knowledge and instruction in the areas of soil, water, wildlife and the forest.

Public school systems in this area have a positive attitude towards programs taught at the Educational Forest. Forest use has been very good with an increasing number of students each year. This is due to Environmental Education Workshops for area school systems which are presented to teachers acquainting them with teaching in an environment such as we offer here at Bladen Lakes.

As educators work with our staff, attend workshops and familiarize themselves with our facility, Bladen Lakes Educational State Forest will be used to a maximum capability.

Gene W. Kinlaw
Gene W. Kinlaw
Assistant Forest Supervisor

GWK:pr

P.O. Box 27687, Raleigh, North Carolina 27611-7687 Telephone 919-733-2162

An Equal Opportunity Affirmative Action Employer

TO WHOM IT MAY CONCERN:

North Carolina has the sole responsibility to administer and operate the 32,237 acre Bladen Lakes State Forest as a demonstration commercial forest land unit using scientific forest management practices. The economic feasibility of forest land management and protection are of interest to private landowners, public school groups, K-16, and others.

The forest provides an active demonstration for development of all forest resources. This forest develops timber resources through thinning, planting, and timber stand improvement practices, and provides forest products and employment to not only the local economy, but to North Carolina as a whole. The forest wants to expand all activities of the Educational State Forest at all levels. Existing stands on Bladen Lakes need extensive thinning for small roundwood products such as posts and pulpwood. These products are of low value requiring that forest operations be subsidized by appropriations.

Bladen Lakes State Forest is operated totally from receipts generated from the sale of forest products. Current market conditions and a significant decrease in available merchantable products make this enterprise no longer capable of totally supporting itself. Forest products sales in North Carolina and the South are severely depressed by a depressed pulp and paper market and a large supply of imported Canadian lumber.

This situation has existed for at least four years resulting in 1985 log and timber prices being only slightly higher than 1981. The result is an increasing depletion of the Bladen Lakes State Forest timber reserves at a price that is very depressed. Since its inception the logging effort has supported a major portion of the program at this forest as well as special projects of the Division.

With the depressed prices of timber, this is no longer possible. It is now in the best interest of the state to provide (10) appropriated positions, which is the current number of employees, (down from 18 in 1986), and to provide receipts funding for (1) position as well as the operating funds of the forest. The sale of forest products under this plan will generate a much reduced level of receipts. This action will extend the resources of the forest and allow us to make forest product sales at a time when they will be more valuable.

This forest is representative of approximately 500,000 acres of low production, longleaf pine type. Studies should be conducted and forest practices modified to demonstrate how this land can be effectively and economically managed in

light of the current and anticipated changing opportunities in private non-industrial forest ownerships. Evaluations f productivity should continue. The forest stands with diversified values are now an excellent example of the best management practices for many landowners. The land has been reserved for its highest and best use with allocations of land to other management units in the past. The use of Bladen Lakes State Forest for these purposes represent the potential for a long term payoff for taxpayers far in excess of the requested appropriation. This forest has been a big asset to North Carolina since it's inception and aided many of it's associate agencies which are appropriated.

PERTINENT INFORMATION:

	1984-85 Actual	1985-86 Actual	1986-87 Projected	1987-88 Projected
Sawtimber Harvested (Bd.Ft.)	1,490,000	1,100,000	800,000	-0-
Pulpwood Harvested (Cds)	3,107	4,192	2,500	7,000

APPROPRIATIONS NEEDED: (Fy. 1987-88)

Salaries (10 Positions)	$168,732
Social Security	12,368
Retirement	18,898
Hospital Insurance	7,660
Motor Vehicle Operations	4,342
Educational Supplies	2,500
TOTAL:	$214,500

APPENDIX H

SCHOOL ADMINISTRATIVE SUPPORT

Bladen County Schools
P.O. Box 37
Elizabethtown, North Carolina 28337
919-862-4136

ADMINISTRATION
W.J. HAIR
Superintendent
A.I. MAYNARD
Associate Superintendent
E.M. WILLIAMS
Assistant Superintendent

November 3, 1986

To Whom It May Concern

Bladen Lakes Educational State Forest is designed to provide learning experiences in forestry management practices, ecology concepts, and environmental awareness. Students of Bladen County Schools would benefit from exposure to the sites and resultant learning by participation in the forestry educational program. Environmental science teaching could be enriched by greater utilization of this community resource.

Efforts to achieve maximal benefit from this facility are supported and encouraged by the administration of Bladen County Schools.

Sincerely,

W. J. Hair
Superintendent

WJH/cp

Bladen County Schools
P.O. Box 37
Elizabethtown, North Carolina 28337
919-862-4136

ADMINISTRATION
W.J. HAIR
Superintendent
A.I. MAYNARD
Associate Superintendent
E.M. WILLIAMS
Assistant Superintendent

November 3, 1986

To Whom It May Concern

Please consider this letter a document in support of attempts to expand utilization of the educational sites available to students of Bladen County Schools at Bladen Lakes State Forest.

Use of these sites would be profitable to students and enhance the study of the following curriculum areas: Forestry Management Practices, Ecology, Plant and Animal Communities, Heritage, Conservation, and Weather.

Through well-planned sequences of lesson plans and coordinated field trips, beneficial and memorable experiences could be provided for boys and girls.

Objectives within the state competency based curriculum that would be accomplished include the following:

Motivation of positive attitudes toward the natural environment.

Practice in use of scientific processes such as observing, measuring, classifying and hypothesizing.

Application of classroom acquired skills to real-life situations.

Efforts to achieve maximal benefit from this facility are supported and encouraged by the administration of Bladen County School.

Sincerely,

A. I. Maynard
Associate Superintendent

AIM/cp

APPENDIX I

TEACHER SURVEY

BLADEN COUNTY SCHOOLS
STAFF DEVELOPMENT
SURVEY

The information in this questionnaire will be used by Bladen Lakes State Forest and Bladen County Board of Education personnel to compile a list of recommendations for improving and increasing utilization of the demonstration trails within the forest. Your answers do not imply any committment. This is a survey of attitudes and a search for ways we might improve and increase the use of this facility.

1. Did you and your students visit the Bladen Lakes State Forest during the last school year? _____

2. If yes, indicate approximate date(s) _____

2b. If NO, go to #6.

3. Describe the approximate schedule of your visit._____

_____

_____

4. What part of the learning experience did you think was most beneficial to your students?

_____

5. How could the facility and your schedule have been improved to enhance the learning experience for your students.

_____

6. If you did not use the forest educational trail centers, please indicate your reasons.

_____

_____

7. Please indicate any suggestions you have for making use of the forest more beneficial to students and facilitative for teachers.

_____

_____

_____

APPENDIX J

WORKSHOP PARTICIPANT SURVEY

QUESTIONNAIRE : FORESTRY WORKSHOP PARTICIPANTS

1. How do you feel about the experiences you had in the environmental workshop?

_____

_____

2. How do you plan to use the forest demonstration sites as a result of the experiences?

_____

_____

3. What reasons do you attribute to the low percentage of use of this facility by local teachers?

_____

_____

_____

4. What could be done by forestry personnel, in the facility, or by the educational unit to increase utilization?

_____

_____

_____

_____

PARTICIPANT EVALUATION OF THE STAFF DEVELOPMENT ACTIVITY

Instructions

Each participant in this staff development activity should evaluate the quality of the activity by checking whether he/she Strongly Agrees, Agrees, is Undecided, Disagrees, or Strongly Disagrees with each of the statements below. (The director of the activity should summarize for the group and record the results in Section I of the Evaluation Report Form SD-26.)

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	
					1. The activity objectives were related to my educational concerns.
					2. The activity objectives were related to practical educational application in my specific job setting.
					3. The activity had some outstanding components which were unique or innovative.
					4. Presentations were well organized.
					5. The program schedule was well adapted to my educational needs.
					6. My questions were satisfactorily answered by personnel conducting activity.
					7. Meeting facilities were suitable.
					8. The strategies utilized, including instructional resources, were appropriate for meeting the stated objectives.
					9. Overall, personnel conducting the activity exhibited the qualities essential to the success of the workshop. (Consider creativity, specialized knowledge, communication skills, and the like.)
					10. Overall, the activity was a successful training experience for me.
					11. Adequate provisions were made for me to provide feedback to the personnel conducting the workshop.
					12. Adequate provisions were made for me to identify needs which were not previously identified.
					13. As a result of this staff development activity, I will alter my educational behavior in a more positive direction in my specific job setting.

Comments: _____

_____

_____

_____

_____

JEH/shw
4/78

STAFF DEVELOPMENT EVALUATION SUMMARY REPORT

Instructions

Each LEA or SEA sponsor or director of a certificate renewal activity or other major staff development activity (ten contact hours or more paid for from state or federal sources) is responsible for completing this summary form and returning it to the Division of Staff Development, State Department of Public Instruction, upon completion of the activity.

A. Descriptive Title of Activity _____

Code (Leave Blank) _____

B. Sponsored by _____
(Name of LEA or SEA Division)

Code (Leave Blank) _____

C. Beginning and Ending Dates of Activity _____

D. Number of Participants _____

E. Person Completing Report _____

Title _____ Address _____

F. ☐ Check here if activity was utilized for certificate renewal credit.

G. ☐ Check here if activity was utilized for initial certification or endorsement credit.

H. Personnel providing majority of instruction were from (check only one):

____1. Institutions of Higher Education ____2. Local Education Agencies

____3. State Education Agency ____4. Others (Specify)_____

I. Beside each item which was rated by one or more of the activity participants, indicate the number who responded to each of the five possible ratings.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	
					1.
					2.
					3.
					4.
					5.
					6.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	
					7.
					8.
					9.
					10.
					11.
					12.
					13.

JEH:sc
6/79

APPENDIX K

TESTS: PRETESTS AND POSTTESTS

TREE RINGS TEST

NAME_____ _____

HAVE YOU EVER VISITED BLADEN LAKES STATE FOREST BEFORE?

YES_____NO_____

PLEASE ANSWER THE FOLLOWING TRUE/FALSE QUESTIONS.

1. It is possible to tell a tree's age without cutting it down.

TRUE_____ FALSE_____

2. Growth rings show the tree's age.

TRUE_____ FALSE_____

3. There is a tool used by rangers to tell a tree's age.

TRUE_____ _____ FALSE_____

4. The heartwood is the living part of the tree.

TRUE_____ FALSE_____

5. Tree rings are spaced wider during poor growing seasons.

TRUE_____ _____ FALSE_____

FOREST LIFE GAME PRE AND POST TEST

HAVE YOU EVER VISITED BLADEN LAKES STATE FOREST BEFORE?

YES_____ ____ NO_____ _____

PLEASE ANSWER THE FOLLOWING TRUE/FALSE QUESTIONS.

---

1. It is not good to cut down trees.

   TRUE_____FALSE_____

2. Trees left alone grow better.

   TRUE_____FALSE_____

3. Many things we use come from trees.

   TRUE_____ FALSE_____ _____

4. Trees are a renewable resource.

   TRUE_____FALSE_____

5. Trees should be managed like crops.

   TRUE__ _____FALSE_____

APPENDIX L

PARENT INFORMATION LETTER

State of North Carolina
Department of Natural Resources and Community Development
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Harry F. Layman
Director

Dear Parents,

Your child is being afforded the opportunity to visit Bladen Lakes Educational Forest by Bladen County Schools. The purpose of this educational field trip is to enhance student participation in various quality organized programs available at the Forest designed to accomplish the objectives of the environmental education curriculum. This science experience will include interpretive and demonstration exhibits and trails developed for use as living environmental education centers. All exhibits and trails are constantly maintained for your child's safety. Rangers are on hand to facilitate school groups on all visits.

Your child's teacher will be conducting classroom learning opportunities in preparation for the environmental education classes and follow-up culminating experiences. Pre and post tests will be given in the classroom and on the forest.

Your family is also invited to come to the Forest on the 3rd. week-end in each month, March through November. The hours are from 10 o'clock AM to 5 o'clock PM on Saturday and Sunday.

To better observe the Forest and its many functions, a 3 1/2 mile driving trail has been developed with four major stations and numerous drive by signs. Learn the importance of the Naval Stores Industry from England in the 1800's to Bladen Lakes State Forest today. Stop and walk the Turnbull Creek Trail and experience the deepness of the woods with its black water creek. At the Smith Swamp Forest Management Trail, you will discover the forest, beginning with a logging cart and ending your short walk by learning how today's forester measures the woodland's many products. Step onto the large deck at the Forest Products Exhibit and learn of the many products produced and sold from the forest.

P.O. Box 27687, Raleigh, North Carolina 27611-7687 Telephone 919-733-2162

An Equal Opportunity Affirmative Action Employer

Drive carefully as you move from stop to stop; the forest is managed for multiple use, and the numerous deer, hawks, squirrel, and other wildlife may please you with a quick view.

Several outdoor classroom study sites and a natural amphitheater are available for special sessions or groups.

Picnic tables are available to further enhance your woodland experience.

Sincerely,

Claude A. Hood
Forest Supervisor

Gene W. Kinlaw
Assistant Forest
Supervisor

CAH/GWK:pr

APPENDIX M

FORESTRY PERSONNEL EVALUATION

State of North Carolina
Department of Natural Resources and Community Development
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Harry F. Layman
Director

Bladen Lakes State Forest
Route 2, Box 942
Elizabethtown, N.C. 28337

July 1, 1987

Bladen County Board of Education
Attn: Mrs. Ann Elks
P.O. Box 37
Elizabethtown, N.C. 28337

TO WHOM IT MAY CONCERN:

Bladen Lakes Educational State Forest and Bladen County Board of Education established a pilot program for all fourth graders in Bladen County for the 1986-87 school year. The purpose for establishing the program was to teach the history of naval stores in North Carolina and organized programs dealing with soil, water, wildlife, the forest and environmental problems.

A series of workshops were held to organize field trips to Bladen Lakes Educational State Forest and inform teachers of program format and scheduling by individual schools.

The general evaluation by the Bladen Lakes Educational State Forest staff is success in all areas. Principles and teachers scheduled promptly, arrived on time and students were well informed on programs and were eager to learn. Pre and post tests were administered by teachers to evaluate the forest staff performance and program effectiveness. Teacher evaluation forms were also presented to all teachers involved.

Bladen Lakes State Educational Forest staff facilitated 1,067 students in May, 1987, and 557 Bladen County fourth grade students and teachers were involved. The Bladen County Board of Education and all teachers involved in the pilot program are to be commended. With the help of Board of Education supervisors and teaching staff, the program was well organized and classified very successful.

P.O. Box 27687, Raleigh, North Carolina 27611-7687 Telephone 919-733-2162

An Equal Opportunity Affirmative Action Employer

The Bladen Lakes Educational State Forest staff is looking forward to continuing our endeavor to teach environmental educational programs to Bladen County students in the future.

Sincerely,

Gene W. Kinlaw
Assistant Forest Supervisor

Glenn M. Watkins
Educational Ranger

GWK,GMW:pr

APPENDIX N

NEWSPAPER ARTICLES: WORKSHOP

Outdoor Workshop Held For 26 Area Teachers

By ANN A. HOOD

Twenty six teachers from Bladen and surrounding counties were engaged in a hands-on, as well as classroom, environmental education workshop offered by the North Carolina Department of Forest Resources

Their mornings were spent in the "outdoor classroom", investigating how soil, water, the forest and wildlife relate to the environment to better enable them to lead outdoor education sessions for their students.

While preparing themselves the participants learned to observe their surroundings and to collect, record and interpret data concerning the forest, soil, water, wildlife and the "human community". Various activities were planned, using a process and problem solving approach to environmental education.

There were eight instructors (or facilitators) leading the activities during the week, the first to be held of its kind, with four others planned for the state's other educational state forests located throughout the state. Those facilitators were:

Alexander Ross Moore of Lenoir, chief facilitator of Natural Resources "and Com-

Tom Hegele of Raleigh, N.R.C.D.; Virginia Bass of Raleigh, N.R.C.D.; Gene Kinlaw of Elizabethtown, Bladen Lakes State Forest;

Calvin A. Wheatley of Purlear, Rendezvous Mountain State Forest; Carl Johnson of Raleigh, N.R.C.D.; Susan Rishel of Greensboro, Grimsley High School, and Dan Stamm of Clayton, Clemmons State Forest.

The teachers were selected from a list of those who responded to fliers sent to all school systems throughout the state. After making application to the Raleigh Division of Forest Resources, they were selected and assigned to the workshops nearest their locations.

Those who did not commute daily were housed at White Lake as were the facilitators.

On completion of the workshop the K-12 teachers were awarded certificates for three continuing education units.

"During the week the facilitators assisted the teachers as they learned different methods of guiding their students to think for themselves, particularly on en-

(Continued To Page 9)

125

126

Teachers In "Outdoor Classroom"

The teachers above study the factors which influence the growth of various tree species in [illegible] environmental workshop. — Ann Hood Photo —

Environmental training...

Fifteen local educators spent last week studying the environment at Bladen Lakes State Forest. The camp, conducted by the North Carolina Wildlife Resources Commission and the North Carolina Department of Forest Resources, was designed to help the teachers do a better job in the classroom. The group shown above is learning what conditions in the environment have to do with the growth patterns of trees. (Jack Heustess, photo)

Local educators learn about the environment at workshop

Fifteen Bladen County educators were among 26 students at an Environmental Education Workshop held at Bladen Lakes State Forest and Bladen Lakes Elementary School.

The workshop, sponsored jointly by the North Carolina Wildlife Resources Commission and the North Carolina Department of Forest Resources, encouraged participants to learn to observe their surroundings and to collect, record, and interpret data from the forest, soil, water, wildlife, and the human community. These activities were carried out by using a process-and-problem-solving approach to environmental education.

The instructors assisted the teachers in learning different methods of guiding their students to think for themselves, particularity on environmental subjects that they may not be totally at ease with in the outdoor environment classroom such as that at Bladen Lakes Educational Forest.

"Making decisions about the management of our environment becomes a little easier if we understand what makes up that environment and know how our actions affect it," said Gene Kinlaw, Interpretive Ranger with the Bladen Lakes State Forest. "The process and techniques contained in the workshop investigations enabled participants to examine different components of the environment and help them to understand the relationship among these components."

The workshop was one of five to be conducted across the state this summer. Participants registered for the workshop through the Division of Forest Resources and the local schools. The group received certificates in ceremonies Friday afternoon and will receive three units of continuing education credit.

Local educators who took part in the workshop were: Inez Allen, Tar Heel; Anne Brantley, Elizabethtown; Anne Clark, Clarkton; Ray Crabtree, Bladenboro; James Fisher, Elizabethtown; Beverly Gardner, Dublin; Peggy Gray, Elizabethtown; Angela Hursey, Dublin; Connie Kinlaw, Tar Heel; Janie Kinlaw, Elizabethtown; Mac Council, White Oak; Jean Sessoms, Bladenboro; Patricia Suggs, Elizabethtown; Victoria Taylor, Elizabethtown; and Glen Watkins, Elizabethtown.

...king Bark Prints At Workshop

...from the Bladen area make crayon prints of the bark of a pine tree behind Bladen ... Elementary School as they compare the barks of various trees in their five-day en... workshop.

—Ann Hood Photo—

Here's How To Do It

Carl Johnson, a facilitator for the environmental workshop for teachers, right, demonstrates to Calvin Wheatley, a fellow facilitator, and Susan Rishel, a facilitator interm, how to use an increment borer to extract a sample from a pine tree.

vironmental subjects which they may not have been totally at ease with in the outdoor environment classroom, such as we have here at Bladen Lakes Educational Forest," said Gene Kinlaw, interpretive ranger for BLSF.

He continued, "Making decisions about the management of our environment becomes a little easier if we understand what makes up that environment and know how our actions affect it. The processes and techniques used in the workshop investigations enabled participants to examine different components of the environment to help them understand the relationship among these components."

Kinlaw said the environmental workshops will be scheduled each summer across the state. He said the sponsoring agencies were "pleased with the response and the enthusiasm" shown by those who attended. They were: Inez C. Allen of Tar Heel, Mable V. Baird of Madison, Sandra K. Berry of Red Springs,

Trees Talk At State's Five Educational State Forests

Educational State Forests offer their visitors the opportunity to enjoy the great outdoors while learning to manage and protect the millions of acres of woodland in North Carolina.

Spring is the ideal season for taking the family to one of the state's four educational forests, one located in Bladen County. The trees and shrubs are in full bloom, making the forests even more beautiful.

Each of the N.C. Division of Forest Resources' Educational State Forests feature exhibits and displays about forest management, forest insects, fire control and wildlife. The forests also have two-mile long demonstration trails featuring exhibits relating to forest management.

But by far the most popular attraction is the "Talking Tree Trail," where hidden recorded messages enable the trees to tell visitors about the history of the forests.

Each Educational State Forest has scenic picnic sites with tables and grills, an amphitheater and restrooms.

The new Educational State Forest section of the Bladen Lakes State Forest on N.C. Highway 242 near Elizabethtown is open to the public on the third weekend of each month from 10 a.m. to 5 p.m. both Saturday and Sunday.

This educational, interpretive section features numerous exhibits, including a turpine still, naval stores, charcoal kiln and aircraft used for fighting forest fires. These exhibits are not found at the other Educational State Forests.

Four of the forests are open Wednesdays through Sundays through November. On weekdays, the four forests are open from 9 a.m. to 5 p.m., and on the weekends the hours are 11 a.m. to 8 p.m.

These four forests are: Clemmons Educational State Forest near Clayton, Rendezvous Mountain Educational State Forest near Miller's Creek in Wilkes County, Tuttle Educational State Forest between Lenoir and Morganton and Holmes Educational State Forest near Hendersonville.

APPENDIX o

RESOLUTION ADOPTED BY SCHOOL BOARD

BLADEN COUNTY BOARD OF EDUCATION

RESOLUTION

March 2, 1987

WHEREAS: the Bladen County Board of Education is committed to the purpose of providing the best education possible to the students of Bladen County, and

WHEREAS: achievement of the objectives of the science curriculum as outlined in the North Carolina Standard Course of Study is encouraged and expected, and

WHEREAS: environmental education is an essential part of the curriculum, and

WHEREAS: Bladen County Board of Education is committed to the utilization of local community resources, and

WHEREAS: Bladen Lakes State Demonstration Forest is suitable and equipped to enhance the learning and teaching of ecological concepts, local geography, mathematics, economic concepts, and heritage education. In addition, the site is appropriate as a laboratory for exploration of environmental issues, and

WHEREAS: students of Bladen County Schools and surrounding school systems have need for the kinds of learning experiences that can be provided at Bladen Lakes State Forest: scientific inquiry, environmental awareness, sensitivity and appreciation for the importance of the forest and its management.

BE IT, THEREFORE, RESOLVED that the Bladen County Board of Education expresses support for the appropriate utilization of this facility by students of Bladen County Schools to enrich environmental education and to help realize the goals set for science education, and

BE IT FURTHER RESOLVED that the Bladen County Board of Education values the availability of Bladen Lakes State Forest as an educational facility and endorses support to continue the funding necessary for the operation and continuation of educational services.

APPENDIX P

NEWSPAPER COVERAGE OF FIELD TRIPS

The Wilmington Morning Star, May 19, 1987

Photo by Ray Wyche

Gene W. Kinlaw, assistant forest supervisor at Bladen Lakes State Park, shows a group of students how turpentine is made.

Woodsy classroom is popular

By Ray Wyche
Star-News Correspondent

BLADEN LAKES STATE FOREST — The classroom is the woodlands, the subject matter is all around them and the students pay close attention, happy to be going to school outdoors.

On a recent spring day, Kay Britt's fourth-grade class at Plainview Elementary School in Bladen County attended Bladen Lakes State Forest's educational program for school children. The day's course of study was nature — trees, soils, water and wildlife. The teaching consisted of lectures, displays and a hands-on nature trail hike, with bits of history and economics thrown in.

The day-in-the-forest sessions attract students of all ages from area schools. Bladen Lakes also offers research opportunities for college students and woodland owners who want to learn about production.

Gene W. Kinlaw, assistant forest supervisor, and Glenn Watkins, educational ranger, will be busy this month as schools take advantage of good weather. More than 1,000 pupils will have visited the forest before the end of the month. That is well above the annual average of 2,500, Kinlaw says. He encourages schools to plan trips early in the school year because of the growing demand in the spring.

Bladen Lakes is the site of the first longleaf pine seed orchard in the United States, and it contains many varieties of trees. Its terrain ranges from swamplands to abandoned farmlands.

Students get a close look at how forest resources are produced. Full use of these resources is the policy of Bladen Lakes, and products sold by the forest include pulpwood, fence posts, baled pine straw, charcoal, fat lightwood stumps and pine bark.

In the past, sales of timber products have enabled Bladen Lakes to pay its own costs and to turn over surplus money to the state each year. But a depressed timber market and rising costs have forced a request to the General Assembly for financial help.

The money would be used to hire additional staff to allow more visitors and for other operations, including a 2,500-acres reforestation project.

"Our primary purpose is to show private landowners how to grow timber resources and how to make the most money from their forestlands," Kinlaw says in beginning his lecture to a tour group.

The first stop is a grove of longleaf pines, some with "boxes" slashed into the bark to allow the pine sap to flow for distilling into spirits of turpentine.

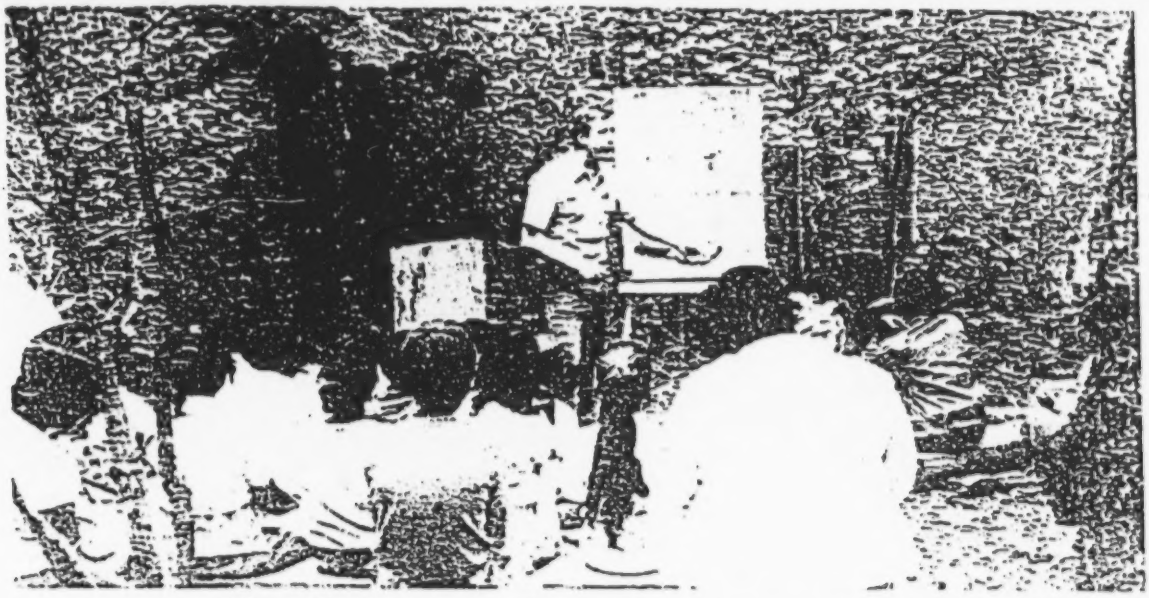
A two-wheeled cart, used decades ago to transport barrels of turpentine out of the woods, sits on the site. Kinlaw tells the students how their grandfathers and great-grandfathers worked in the turpentine woods.

At the Turnbull Creek Nature Trail site, students sit on benches in a natural amphitheater and listen to Watkins explain how longleaf pine seeds are harvested and grown into seedlings for distribution throughout the state. The children are given pine seeds with instructions for planting.

Bladen Lakes State Forest began to take shape in 1937 when the federal government bought about 35,000 acres of timberland and worn-out farmland for $4.41 per acre. The N.C. Forest Service took over the area in 1939. The forest now consists of about 32,850 acres.

Individuals and groups desiring to tour the forest can contact the forest headquarters at 588-4964.

The Southeastern Times May 27,1987



Glenn Watkins instructs Bladen students in tree growth. --Ann Hood Photo--

Regional Thrust Considered

500 Bladen 4th Graders Investigate Their Environment At Bladen Lakes State Forest During School Year

The Bladen County Board of Education adopted a resolution at its March 2 meeting in support of greater utilization of Bladen Lakes State Forest for the county's school children.

During the month of May 500 of the county's fourth graders have taken field trips to the forest for the purpose of "investigating their environment" in the outdoor classroom setting. Another 550 students from other counties took advantage of the learning opportunities provided by the forest this month. The teaching sessions will continue through June 8, when the last school group will have study sessions there for this school year.

Gene Kinlaw, who is heading up the program with Glenn Watkins of the forest staff said he would like for teachers to schedule fall trips for their students, as well as those during spring months. "We are having so many requests for sessions in the spring that we may not be able to work them all in next year. We can instruct learning sessions out here that will be just as effective held in the fall," he stated.

During March a teachers' workshop was taught by Kinlaw and Watkins at the forest to help equip fourth grade teachers with information for preparing their students for the field trips prior to visiting the forest.

The workshops were also planned for the purpose of dispelling any reservations and concerns teachers may have about arranging for the educational sessions (poison ivy, spider bites, snakes, liability concerns, etc.) The Board of Education central office staff took responsibility for handling technical problems which arose.

According to Kinlaw, the student groups have been well organized. He noted that there have been a total of 3,500 students, ranging from kindergarten through university level, taking advantage of the forest curriculum project at Bladen Lakes State Forest this year. That compares to a total of 2,500 last year, he compared.

Some of the good results of school students having "positive learning experiences in the forest "classroom" have been, as listed by Ann Elks of the central office staff: learning activities tie into the state curriculum; students develop a deeper appreciation for the total ecology of the forest, which helps make them aware of conservation and forest management; they develop a sense of scientific inquiry; these aesthetic, ecological impressions will carry over into adulthood; they carry away with them good "life" examples and they get valuable impressions concerning what options they have for spending their leisure time as older adults.

She noted, "They learn about the food exchange, the soil, the water, how plant and animal life interact, local geography, the history of naval stores and of other forest operations."

When students return to their respective classrooms, they are tested on what they learned from the forest exposure.

Kinlaw said applications are being taken from now through June 1 for any teacher in the state, who is interested, to attend the Environmental Education Workshop on the forest from June 22-26. The extensive instructional session is co-sponsored by the Division of Forest Resources and the Wildlife Resources Commission. It will be the second annual workshop held at BLSF.

APPENDIX Q

CALENDAR PLAN

CALENDAR PLAN

A projected time line of events for this practicum proposal was completed after implementation. The following is a tentative implementation time schedule:

September, 1986.....Formulation of problem statement
October, 1986.....Outline of proposal
November, 1986.....Proposal Submitted
December, 1986.....Prepalnning
January, 1987.....Began Implementation

Implementation.....January - March, 1987

Continue review of the literature
Plan and conduct inservice for teachers with forestry personnel
Awareness blitz in community and schools
Administrative approval of time line and plan
Public presentations
Dissemination of materials within schools
Administer pretests
Schedule trips to forest for target classes
Implement follow-up learning/teaching strategies
Posttest student participants via test data and teacher surveys
Collect data to determine if environmental awareness increased.
Compute attendance data

DISSEMINATION .....March, 1987- May, 1987